EFFECT OF SENSORY STIMULATION ASSESSMENT MEASURE (SSAM) ON LEVEL OF CONSCIOUSNESS AMONG CLIENTS WITH TOTAL BRAIN INJURY (TBI) AT SELECTED HOSPITAL, CHENNAI.

DISSERTATION SUBMITTED TO

THE TAMIL NADU DR.M.G.R.MEDICAL UNIVERSITY

CHENNAI.

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF

MASTER OF SCIENCE IN NURSING

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''Sing to him,,sing praise to him:all praise to u oh Lord"

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ABSTRACT

Evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with Total Brain Injury (TBI), at a selected hospital Chennai.

Introduction

Health is the level of functional or metabolic efficiency of a living being. In humans, it is the general condition of a person's mind, body and spirit, to get aware of the surroundings.

Unconscious is lack of response to sensory stimuli as a result of hypoxia and it can be brief lasting for a few seconds to minutes or sustained, lasting for an hour or longer. The outcome ranges from recovery to death. Glasgow coma scale (GCS) is a widely used standardized scoring system to assess the consciousness.

Traumatic brain injury (TBI) is the major cause for unconsciousness. Approximately 60 percent will make a positive recovery, and an estimated 25 percent will be left with a moderate degree of disability. Death or a persistent vegetative state will be the outcome in about 7 to 10 percent of cases. The remaining patients will have a severe degree of disability.

To facilitate the recovery process, Sensory Stimulation Assessment Measure (SSAM) has been developed. Sensory stimulation for Total Brain Injury clients act by increasing environmental stimulation to the part of the brain that controls the level of consciousness, attention and concentration.

It has been proposed that the intense and repeated stimulation and following very precise protocols, a patient could be awakened early from unconsciousness and returned to higher level of functioning

Sensory Stimulation Assessment Measure (SSAM) should commence as early as possible after development of unconsciousness. Therefore improved health outcomes would be anticipated by reducing the duration of unconscious state.

SSAM course ranges from 30 minutes hour or 2 cycles of stimulation daily, lasting from 15-30 minutes for 12-14 hrs per day, six days in a week

0bjective

To evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with Total Brain Injury(TBI).

Design

Quantitative Quasi experimental design was used

Setting

The study was conducted in the SIMS Hospital at Vadapalani, Chennai.

Participants

50 clients with 25 each in the experimental and control group who satisfied the inclusion criteria were selected by using purposive sampling technique.

Intervention

Selected sensory stimulation Assessment Measure was administered to the client by the investigator for the clients in experimental group to improve the level of consciousness and regular treatment without Sensory Stimulation Assessment Measure (SSAM) for the control group**.**

Measurement and Tools

The level of consciousness wasassessedby using Glasgow coma scale. Descriptive and inferential statistics were used to analyse the data.

Findings

The major findings of the study revealed that the overall mean difference level of consciousness in the experimental groupwas 10.72 with the t value of 7.483 which shows a statistically significant at $p<0.001$ level.

Conclusion

The study concluded that there was a significant difference in the post test level of consciousness after administering the SSAM. This revealed that the SSAM will help the clients to improve the level of consciousness in the management of Total Brain Injury which in turn will improve their quality of life. Every nurse caring for Brain Injured clients can execute the practice of SSAM in clients with unconscious state.

Implications

The study can be applied to nursing practice. Nursing education and nursing research. The significant effect ofSSAMin the level of consciousness among clients with Total Brain Injury (TBI) suggested the use of safe and effective complementary therapy while taking care of clients with Total Brain Injury (TBI) to improve the recovery .This can be added to many other tools used by neurologist. Further research is suggested to determine the effect of SSAM.

Recommendations

The study can be conducted on large scale for better generalization .Quality of life can be studied using such type of study.

Limitations

The Sensory Stimulation Assessment Measure (SSAM) was limited for 30 minutes per session for two times a day into 6 days. Findings of the study have limitation in generalization due to low sample size that is 50 (25 in each group).

CHAPTER – I

INTRODUCTION

"The brain is a wonderful organ, it starts from the moment you get up into the morning and does not stop** until **you get into the office"-Robert frost.

BACKGROUND OF THE STUDY

Brain injury is an insult to the brain, not of a degenerative or congenital nature but caused by an external physical force, that may produce a diminished or altered state of consciousness which results in impairment of cognitive abilities or physical functioning. These impairments may be either temporary or permanent and cause partial or total disability or psychosocial maladjustment.

The impact of TBI on individuals varies in the degree of severity and associated characteristics. In India there is one TBI every 15 seconds. The primary cause of TBI in India are motor Vehicle accidents, falls, assaults, firearm injuries and sporting injuries .To facilitate the recovery process, sensory stimulation programme has been developed. Sensory stimulation programs operate on the belief that brain has restorative properties.

According to a survey conducted in 2013 by National Institute of mental health and Neuro science, the incidence of mild unconscious was 131 cases per 1,00,00 people, 15 cases per 1,00,000 people were moderate unconscious a 14 severe cases per 1,00,000 people.

Among all types of injury, those to the brain are among the most likely to result in death or permanent disability, estimates of traumatic brain injury, incidence, severity, and cost reflect the enormous loses to individuals, their families and society from these injuries. These data demonstrate a critical need for more effective way to prevent brain injuries and care for those who are injured.

Sensory stimulation programme is based on environmental effect theory for the recovery of brain. Sensory stimulation is essential factors in stimulating the reticular

activating system to maintain consciousness. The aim is to arouse a patient from unconscious level and try to awaken them. Many types of efforts are made including showing the patientto look at, Playing music, speaking, touching and offering things to the patients to smell, taste and touch.

The Centres for Disease Control and Prevention (CDC (**2014)**, reported that TBIs were a factor in the deaths of more than 50,000 people in the United States .More than 2,80,000 people with TBI were hospitalized. Traumatic brain injury is a leading cause of death and disability worldwide. Every year, about 1.5 million affected people die and several millions receive emergency treatment. Most of the burden (90%) is in low and middle-income countries. The costs of care depend on the level of disability. The burden of care after traumatic brain injury is caused by disability as well as by psychosocial and emotional sequelae of injury. The final consequence of brain injury is the reduction of quality of life.

W.H.O,(2015), reported that 100-300/1,00000 people per yet affected with TBI.54 to 60 million people worldwide sustain TBI each year.TBI is projected to become third leading cause of disease burden worldwide by 2020.

In Indian (2014) it is estimated that nearly 1.5 to 2 million persons injured & 1 million death every year due to TBI.

NEED FOR THE STUDY

"The brain gives the heart its sight, The heart gives the brain its vision"-Kall.

TBI is the leading public health problem in the world. Clients receiving indoor treatment due to various causes of coma, but special attempts are not made bring them out of coma. As a result it may happen that the causative disease is cured but coma may persists.

Patients in coma given stimulation therapy by using locally available and low cost materials showed better recovery than similar group of patients treated without stimulation .SSAM as one of the tool for TBI clients in improving the level of consciousness for coma patient.

Journal of Neuro Science in Nursing (2015), recommends that SSAM is found highly effective in coma patients for the improvement in level of consciousness. In the study LOC was better in study group as compared to control group after stimulation therapy.

Moseley et al (2016), reported that SSAM are known to have beneficial effects on TBI. Evidence of plasticity noted throughout the nervous system includes increase in number of receptor sites and improve neurological function, so exposure to SSAM promote arousal from TBI without influencing cerebral dynamic status.

Mandeep (2013), conducted a study to find out efficacy and benefits of early intervention of Coma Arousal Therapy on patients with low GCS after sustaining TBI. ANOVA and Post hoc paired t-test were used for analysis. Group A(experimental), mean of GCS score on 1^{st} , 7^{th} and 14^{th} day of SSAM was 2.05(±1.02), 4.78(±1.14) and 8.66(±1.36) respectively and for Group B(control) was 2.06(±1.01), 287(±1.07) and 4.63(±2.12) respectively, which showed statistically significant improvement ($p \leq 0.5$). Compared between the groups, experimental group showed significant improvement in GCS, The result of this study shows that Coma Arousal Therapy has significant effect on coma recovery scale in TBI patients when compared to the patients who did not receive Coma Arousal Therapy.

Bradely (2014), reports on the efficacy of SSAM. This procedure involved a programme of vigorous sensory stimulation administered to comatose patients by relatives using Coma kits. Results indicate that the total duration of coma was significantly shorter and that coma lightened more rapidly for the experimental group.

Kamal V K 2016, Traumatic brain injury (TBI), a significant public health problem ,is a leading cause of disability mortality in all regions of the world despite advancement in prevention and treatments. India and other developing countries are facing the major challenges of prevention, pre hospital care and rehabilitation in their rapidly changing environments to reduce the burden of TBIs.

WHO (2016), estimates that almost 90% of deaths due to injuries occur in low and middle income countries, where 85% of population live and this situation will continue to represent an important global health problem in the upcoming years.

Caroline Schnakers, Wendy L. Magee (2016), states that Theories of brain plasticity, which suggest that an adult injured brain has the capacity to reorganise itself to compensate for affected regions, have broadly been accepted for several years. The most famous case illustrating this phenomenon is the case of Terry Wallis. This patient remained in a minimally conscious state for 19 years after a brain injury and yet recovered functional verbal and motor activities. A study of this case revealed a neural change, mainly involving precuneus which is related to consciousness. These results stress the importance of developing therapeutics that intensify brain plasticity in severely brain injured adults to reach full recovery of consciousness.

Geha (2017), Sensory stimulation is intended to enhance the rehabilitative potential of brain-injured individuals in a coma or vegetative state. Protocols may involve stimulation of any or all of the following senses: Visual, gustatory, olfactory, auditory, cutaneous and kinaesthetic various stimuli may be used for each sense. Protocols may differ with respect to who performs the stimulation and where. Professionals include: nurses, occupational therapists, physical therapists, and speech language therapists. In some cases family member may be trained in the techniques and are given primary responsibility for proceeding the therapy. Treatment may be delivered in the hospital, the patients home, or a nursing home.

M.Megha et al, (2013), conducted a study to evaluate the effectiveness of multimodal stimulation in comatose individuals with traumatic brain injury.Thirty comatose patients with traumatic head injury GCS below8 were selected and were divided into three groups randomly. Study participants from experimental group received multimodal stimulation prior to stimulation participants level of consciousness was assessed using the western neuro sensory stimulation people and the Glasgow coma scale. Final results showed significant improvement in measures consciousness levels in the respective treatment groups.

Carlo Abbate (2014) Describes in their study that Sensory Stimulation for patients with disorder of consciousness refers to a corpus of approaches aimed at promoting arousal and behavioural responsiveness by the application of environmental stimuli. It usually involves the stimulation of many different sensory modalities e.g(visual, auditory, tactile etc) Sensory Stimulation is a low invasive, not dangerous, inexpensive and simple to apply methodology for these reasons it remains a potentially attractive rehabilitative method.

Sensory Stimulation Assessment Measure (SSAM) is a very powerful methodology to stimulate nervous system .It can stimulate the reticular activating system and thus very beneficial for the Total Brain Injury clients to regain consciousness and help for fast recovery if SSAM should be done at early stage of brain injury.

The researcher, from her clinical experience, review of literature and discussion with experts felt a strong need to promote healthy means for improving the level of consciousness for Total Brain Injury(TBI).So the researcher chose to do a study on the effect of Sensory Stimulation Assessment (SSAM) on level of consciousness. among clients with Total Brain Injury (TBI).

STATEMENT OF THE PROBLEM

A study to evaluate the effect of Sensory Stimulation Assessment Measure [SSAM] on level of Consciousness among clients with Total Brain Injury [TBI] at selected hospital, Chennai.

OBJECTIVES

1. To assess the pre test level of consciousness among clients with Total Brain Injury (TBI) in the experimental and control group.
2. To determine the effect of Sensory Stimulation Assessment Measure [SSAM] on level of consciousness among clients with Total Brain Injury(TBI) in the experimental and control group.
3. To associate the selected demographic variables with level of consciousness during pre and post test among the clients with Total Brain Injury(TBI) in the experimental and control group.

OPERATIONAL DEFINITION

Evaluate

It is the outcome of the selected SSAM in improving the level of consciousness elicited by the investigator with the help of Glasgow Coma Scale (GCS).

SSAM

If refers to the outcome score obtained by the sample after administration of selected SSAM [Visual, auditory, tactile) elicited by the Glasgow Coma Scale(GCS) , on clients with TBI. It is done for 15 minutes twice a day for 6 days in each clients.

Visual stimulation

Pen torch, Bright coloured blocks and coloured board was shown in sequences from periphery to center of the right eye and then left eye. Each stimuli was given for 10 seconds , three times for 5 minutes to assess the responsiveness to the stimuli with a break of 2 seconds given. These stimuli was administered twice a day for 6 days.

Auditory stimulation

Calling by name, recorded religious chants, one step verbal command was used in the sequence of right ear and then left ear, Each stimuli was given for 10 seconds, three times for 5 minutes to assess the responsiveness to the stimuli with a break of 2 seconds given. These stimuli was administered twice a day for 6 days.

Tactile stimulation:

Warm and Cold wash clothes , wisp of cotton wool was applied in sequences along the spinothalamic root of non injured limbs and sternum was rubbed ..Each stimuli was administered for 10 seconds three times with 2 seconds break between each stimulus to assess the responsiveness of the stimuli. These stimuli was administered twice a day for 6 days.

Total Brain Injury

The term Total Brain Injury refers to injury to the brain leads to permanent, or temporary impairment of physical, cognitive, social, emotional and behavioural effect with the GCS of 7-10.

Level of Consciousness

If refers to client arousability and responsiveness to from the environment which is to be measured by Glasgow coma scale (GCS).

Client

Includes both male and female who are clinically diagnosed as TBI with a GCS score of 7-10 and are on treatment in any department at selected hospital Chennai.

ASSUMPTION

SSAM [Visual, auditory, tactile] will be played an important role in recovering of consciousness among clients with TBI.

NULL HYPOTHESIS

NH_1: There is no significant difference in the pre and post level of consciousness among clients with Total brain injury in experimental and control group.

NH_2: There is no significant association of the pre and post-test level of consciousness with selected demographic variables of clients with Total brain injury in the experimental group and control group.

DELIMITATION

The study is delimited to the period of four weeks of data collection.

CONCEPTUAL FRAMEWORK

Conceptual framework acts as a building block for the research study. The overall Purpose of the framework is to make scientific finding meaningful and generalized. It provides a certain framework of reference for clinical practice, education and research. Framework can guide the researchers undertaking of not only 'what' of natural phenomena but also 'why' of their occurrence.

General system theory looks at the world as a system of smaller subsystems. System is a collection of independent but interrelated elements or components organized in a meaningful way to achieve an overall goal.

This model consists of three phases namely **Input, Throughput and Output.**

Input:

In this study ,input refers to the demographic data of Total Brain Injury (TBI) clients. .The investigator assessed the pretest level of consciousness among clients with Total Brain Injury (TBI) using Glasgow Coma Scale in selected hospital.

Throughput:

In this study, it refers to Sensory Stimulation Assessment Measure (SSAM) which includes three senses Visual, Auditory, Tactile in which selected sensory stimuli was administered 15 minutes twice a day for 6 days in each clients in the experimental group with regular medication therapy.

The clients in control group did not received Sensory Stimulation Assessment Measure (SSAM) for 6 days and they received regular medication therapy only.

Output:

In this study, the output refers to the assessment of post test level of consciousness after six days using Glasgow Coma Scale(GCS) among clients with Total Brain Injury (TBI) in the experimental and control group.

Feedback:

In this study, reinforcement given to the clients with significant level of consciousness and reassessment done to clients with no significant improvement in level of consciousness.

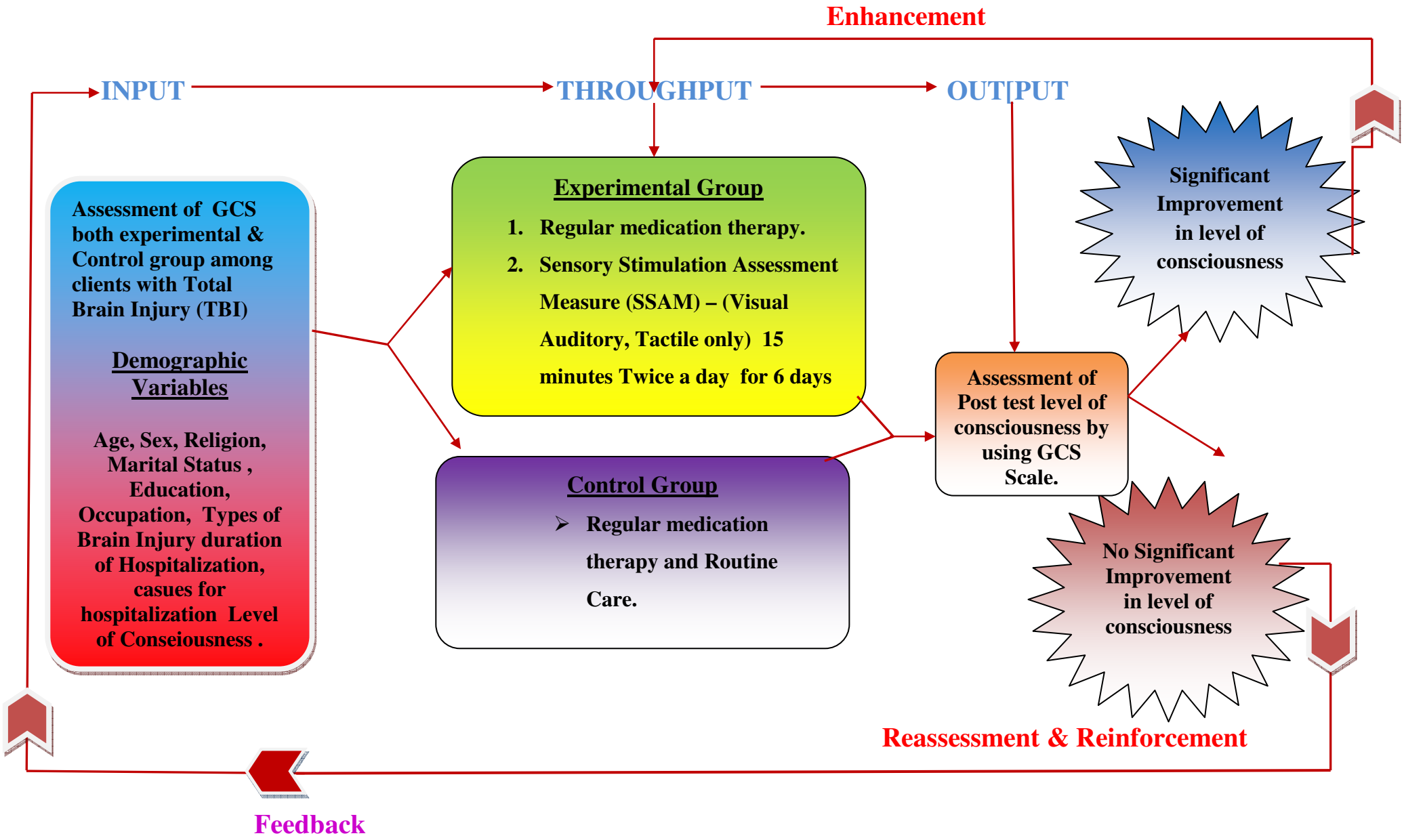


FIG1. MODIFIED LUDWIG VON BERTANLAFFY'S SYSTEM THEORY AS A CONCEPTUAL FRAME WORK FOR THE STUDY

CHAPTER – II

REVIEW OF LITERATURE

Review of literature is a systematic way to search literature to gain information and details about a research topic **(Polit and Hungler, 2004)**. Review of literature is a key step in research process. The typical purpose of analytical a review existing literature is to generate research question to identify what is known and what is unknown about the topic.

The major goal of review of literature is to develop a strong knowledge base to carry out research scholarly activity. The purpose of review of literature is to obtain comprehensive knowledge and in depth knowledge about the effectiveness of Sensory Stimulation Assessment Measure (SSAM) in improving level of consciousness.

The extensive review of literature has been done and organized according to the following three aspects.

Section A: Reviews related to studies on Prevalence and incidence of Total Brain Injury (TBI).
Section B: Studies and literature related to level of consciousness
Section C: Studies and literature related to assessment of level consciousness
Section D: Studies and literature related to effect of SSAM on level of consciousness.

RELATED STUDIES IN LITERATURE REVIEW

SECTION A: REVIEWS RELATED TO STUDIES ON PREVALENCE AND INCIDENCE OF TOTAL BRAIN INJURY(TBI).

International Journal of Critical Illness Injury Science (2016), states that India comprised of 29 states and 7 union territories. It is second most populous country in the world health estimated population of 1.27 billion during 2014-2015. Traumatic brain injury (TBI) results in deaths, injuries and disabilities in all age groups but more in young and productive persons higher in males than females. The most common cause of TBI normally reported in our country are road traffic accidents (RTA) accounting for 60% followed by falls and assaults contributing to 25% and 10% of traumatic brain

injuries respectively. The economic losses to India due to Traumatic Brain Injuries are phenomenal, though unmeasured.

Ranabir Pal (2016), India contributes and considerably impacts global health indicators. A remarkable progress has been made in recent decades to reduce the number of deaths on road, though it is still one of the ten leading causes worldwide. A large population of road crashes are preventable with capacity building in pre hospital care, development of dedicated trauma care centre and functional neuro trauma care practices at non- neurological health facilities with the potential to reduce the burden of needless morbidity, disability and mortality. Traumatic Brain Injury (TBI) is one of the critical causes of death and illness of global health problem world wide.

Amir Sariaslan (2016), carried out an epidemiological study considering of the World Health Organisation ranks Traumatic Brain Injury (TBI) as the leading cause of both disability and mortality in individuals below age of 45 years. TBI accounts for an annual combined average of approximately 8,48,000 hospital admissions and emergency room visits in individuals under the age pf 25 years the majority of which classified as concussions or mild TBI.

Andrew R Mass (2017), quoted in their epidemiological study that TBI is increasingly being recognized as a public health problem of immense proportions with the substantial burden of disability and death occurring in low and middle income countries. In high income countries, the incidence of TBI due to road traffic accidents has decreased following the successful implementation of preventive measures.

A National Institute of Mental Health (2013), conducted a survey in India reported that the incidence of mild unconsciousness was 131 cases per 1,00,000 people,15 cases per 1,00,000 people were moderate unconscious and 14 severe unconscious cases per 1,00,000 people.

N Hemalatha (2013), carried out a prospective study of 41 cases of traumatic brain injury whose medico legal autopsy was done in the institute of forensic medicine, at the Madras Medical College and Government General Hospital, Chennai from December 2007 to June 2008 in the 41 cases, 16 cases (39.02%) were primary brain stem

injury and 25 cases (60.98) were secondary brain stem injury. The mean ages of cases with primary and secondary brain stem injury were respectively 55.7 and 36 .2 Male victims outnumbered the female victims with male female sex ratio of 13:1. Road traffic accidents involving mainly pedestrians and two wheelers were the most common cause for Traumatic Brain Injury.

Baogis Dang (2017), carried out an epidemiological study about the current status in world wide .it was stated that Traumatic brain injury is a major cause of chronic disability. Worldwide it is the leading cause of disability in the under 40s, Behaviour problems, mood, cognition, particularly memory, attention and executive function are commonly impaired by TBI. Such impaired functional outcomes following TBI can be improved via various approaches.

Sara Cohen, MD (2017), conducted a study to assess the severity of Brain Injury and estimated that most TBIs (85%-90%) are mild in severity. The precise definition of mild TBI varies depending on the source but is generally decided as an acute brain injury resulting from mechanical energy to the head from external forces with loss of consciousness less than 30 minutes, post traumatic amnesia less than 24 hours, and Glasgow coma scale (GCS) score of 13-15 after 30 minutes post injury or on presentation for health care. The term "concussion" is often used interchangeably with mild TBI.

Bob Roozenbeek (2013), observed that the epidemiology of TBI has changed over time. A shift towards older age of patients with TBI has been observed, especially in high income countries with falls representing the primary cause of TBI among the elderly, resulting in more contusional injuries. The high incidence of co morbidity and the frequent use of platelet aggregation inhibitors and oral anticoagulants among older patients have a negative influence on outcome following TBI.

Robert .N. Najarian, et al (2014), conducted a study on the incidence of TBI among Indians which revealed the following the average TBI incidence rate is 95 per 1,00,000 population.22%of people who have a TBI is especially high among adolescent units, young Adults and people older than 75 years age. The outcome of these injuries varies greatly depending on the cause, 91% of TBIs resulted in death, but only 11% of

fall related TBIs are fatal. Each year more than 80,000 people survive a hospitalization for traumatic brain injury, but are discharged with TBI related disabilities. 5.3 million persons are living today with a TBI related disability.

CDC (2013), reported that in the United States, children aged 0–4 years, adolescents aged 15–19 years, and older adults aged ≥75 years are the groups most likely to have a TBI-related Emergency department visit or hospitalization. Adults aged ≥75 years have the highest rates of TBI-related hospitalizations and deaths among TBI-related medical visits in the United States.

SECTION B: REVIEWS RELATED TO STUDIES ON LEVEL OF CONSCIOUSNESS

Neuroscience (2014), states that Level of consciousness (LOC) is a measurement of a persons arousability and responsiveness to stimuli from the environment. A mild depressed level of consciousness may be classified as lethargy. clients in this state can be aroused with little difficulty. People who are obtuned have a more depressed level of consciousness and cannot be fully aroused. Those who are not able to be aroused from a sleep-like state are said to be stuporous .coma is the inability to make any purposeful response. Scales such as the Glasgow coma scale (GCS) have been designed to measure level of consciousness.

C.W Hess (2016), states that physiologic components of conscious behaviour**,** namely arousal (vigilance) and content of consciousness (presence of mind), may be affected differently, depending on the type and distribution of the underlying brain disease. Disturbance of arousal primarily affects wakefulness and awareness and leads to obtundation, stupor and coma. States of reduced arousal are caused by bilateral lesions of Ascending Reticular Activating System (ARAS), which is situated in the upper brainstem and the para median diencephalon. If, on the other hand, cognitive and mnemic function are degraded, the contents of consciousness are disordered; depending on the extent of the disturbance, confusion, lethargy and, finally, a vegetative state ensues. The chronic vegetative state (coma vigil) describes a condition of total mental loss with preserved vegetative functions and arousal.

Jakob Hohwy (2016), conducted a study on level of consciousness in that they described consciousness is typically taken to have two aspects: **local** and **global states.** Local states of consciousness include perceptual experiences of various kinds, imagery experiences, bodily sensations, affective experiences, and occurrent thoughts. In the science of consciousness local states are usually referred to as '**conscious contents',** They are typically distinguished from each other on the basis of the objects and features that they represent.

Charles L Emerman (2012), conducted a study on Level of consciousness as a predictor for complication. In this 92 patients reviewed, 37 had serious complications including hypoventilation, hypotension, depressed level of consciousness, significant arrhythmias or death..Patients with complications had increased heart rate ,depressed level of consciousness ,depressed Glasgow Coma scale and prolonged QRS interval. and they concluded that level of consciousness is a better predictor of risk of complications and need ICU admission .

SECTION C: REVIEWS RELATED TO STUDIES ON ASSESSMENT OF LEVEL OF CONSCIOUSNESS

Seel RT (2010), published a report of the American congress of rehabilitation medicine. Assessment scale for disorders of consciousness, according to JFK Coma Recovery Scale Revised (CRS-R) may be used to assess disorders of consciousness with minor reservations and the SMART, Western neuro sensory stimulation profile (WNSSP),sensory stimulation assessment measure (SSAM),Wessex Head Injury matrix(WHIM) and disorder of consciousness with moderate reservation.

Opara (2014), Rader & Ellis developed the Sensory Stimulation Assessment Measure (SSAM). Patient responses on 15 items are divided into three six point behavioural5 sub scales(visual, auditory, tactile, gustatory, and olfactory) .Each items is scored based on intensity of the response to non-invasive, noxious, or painful stimuli in three categories: eye opening, motor, and verbalization.

Douglas l.katz (2010), Several instruments have been developed including western neuro sensory stimulation profile ,the coma recovery scale, the sensory stimulation assessment measure, and coma near scale. These scales provide a systematic

measure of responses using standardized stimulation protocol. Distinctions between vegetative state and minimally conscious state can be made using these scales based on total scores or sub scores on individual items demonstrating purposeful responses evaluation of these scales on the same groups of patients demonstrated fairly high correlations between them.

Hagen et al (2010), The Rancho Los Amingos (RLA) Level of Cognitive Functioning Scale (LCFS) has 8 categories that measure cognitive and behavioural functioning and is commonly used to evaluate overt behaviour. It is a comprehensive behavioural assessment tool which precides an evaluation even when the subject is un cooperative. This scale has been shown to have good reliability but only categories from II-IV have been evaluated and are considered useful for clinical purpose.

Neurocscience (2014), states that Assessment of LOC involves checking orientation people who are able promptly and spontaneously to state their name, location, and the date or time are said to be oriented .A normal sleep stage from which a person is easily awakened is also considered a normal level of consciousness. Clouding of consciousness is a term for a mild alterations in attention and wakefulness.

Steve Majerus (2013), conducted study on behavioural evaluation of consciousness in severe brain damage concluded that patient emerging from unconscious state, is most important that the medical staff was done assessment ,as well as their fluctuation .have to be reliably captured as they are the only means for avoiding misdiagnosis, but also for communicating with these patients. This implies use of standardized, sensitive and individualized assessment tools that cover a wide range of possible behaviour in all sensory modalities.

Urbenjaphol et al. (2012), conducted a study in this they used the sensory modality assessment and rehabilitation technique (SMART) and the GCS to evaluate the effects of a sensory stimulation program on the recovery of unconscious patients with TBI. The results showed significant increase in the SMART and GCS scores after applying multiple sensory stimulation, including tactile, gustatory, and visual in the intervention group. level of cognitive function and basic cognitive sensory recovery was observed in less than 7 days.

Gorji MH (2014),conducted a study among 13 patients with traumatic coma 8 ≤ Glasgow coma scale (GCS) admitted in ICU ward were randomly assigned to control and experimental groups, The experimental group was treated twice a day each time 15 min with recorded MP3 sound for 2 weeks. The control group received only natural voices of environment.GCS applied to evaluate patients level of consciousness and they stated that GCS is a major tool to measure the consciousness level in coma patients and its validity and reliability have been confirmed in many studies (Cronbach' s alpha 96% and coefficient of 94%).

Opara .J.A (2014), carried out a study on cinimetric measurement in traumatic brain injuries reported that the Glasgow Coma Scale (GCS) has been the gold standard of neurologic assessment for trauma patients since its developed by Jennett and Teasdale in 1974.The GCS was found to be a simple tool to use. It became the method of choice for trauma care practitioners to document neurologic findings over time and predict functional outcome.

Nasrin Sharifi (2016), conducted a study on effect of sensory stimulation by nurses among 60 traumatic brain injured clients with an initial GCS score of less than 8.The level of consciousness ,level of cognitive function and basic cognitive sensory recovery of the patients were evaluated and monitored using the GCS.

SECTION C: REVIEWS RELATED TO STUDIES ON EFFECT OF SENSORY STIMULATION ASSESSMENT MEASURE (SSAM)

Hickey (2012), Conducted a quasi-experimental study, the effects of a structured auditory stimulation program [SSP] were examined in 12 male patients, 17-55 years old, with severe TBI. SSP & did not affect hemodynamic or cerebral dynamic status. Early and repeated exposure to an SSP may promote arousal from severe TBI without adversely influencing cerebral dynamic status.

Scheetz (2014), conducted a study on sensory stimulation program (SSP) beginning in the early stages of recovery can be beneficial. This quasi-experimental study examined the effect of an SSP on recovery in unconscious patients after traumatic brain injury. SSP was directed to five sensory modalities including tactile, gustatory, olfactory, modalities auditory and visual. Mean Glasgow coma scale scores after

commencing the SSP in the experimental group were significantly higher than those in the control group(10.45±1.82 vs 5.9±1.77), Respectively, p≤.05. The results indicated that the SSP can enhance brain recovery in traumatic brain-injured patients

Hanagan, Gordan (2015), conducted an experimental study to evaluate the effect of stimulation therapy in unconscious clients among 60 patients 30 in each control and study Group. Common causes of coma were pyogenic meningitis, cerebral malaria, tubercular meningitis & others in decreasing order of frequency. The GCS score showed significant improvement after 2 weeks of stimulation therapy in study groups while in control group GCS score remained almost unchanged and did not show any significant improvement.

Rader & Ellis (2012), States that the Sensory Stimulation Assessment Measure (SSAM) was developed as a neuro psychological approach that provides a reliable and valid measure of responsiveness in patients who can neither communicate nor consistently follow commands. Patient's responses are divided into three six-point behavioural scales (Eye opening, Motor and Vocalization).

Janeen Bower (2013), conducted a study of sensory stimulation for patients in altered states of consciousness, Suggested that cognitive rehabilitation might be more effective if the stimuli are important to the patient. Experimentation with auditory stimulation such as recorded voice, sounds has been shown to induce a widespread neural activation in adult patients in a state of severely reduced consciousness. The results encourage the use of auditory stimulations including music as a cognitive rehabilitative therapy for patients in reduced static of consciousness.

Hossein Tavangar (2014), conducted a study in this single blind randomizes controlled trial, 40 comatose patients with brain injury with acute subdural hematoma in intensive care units were randomly assigned into two groups. The intervention group was stimulated twice a day each time 5-15 min with recorded Mp3 music for 10 days. The patients level of consciousness was measured with GCS before and after auditory stimulations. The finding during ten days showed the changes in the level of consciousness in the intervention group from the 4^{th} day of the study were more in the mean daily GCS score than control group.

M.Megha (2013), conducted an experimental study ,in their studies thirty comatose patients with traumatic head injury (GCS≤8) were selected and were divided into three groups randomly, Group A received stimulation 5 times a day, Group B= received stimulation twice a day and Group C received conventional physic therapy twice daily all three groups received treatment for 2 weeks. The results showed a significant difference ($p \leq 0.01$) for GCS as well as western neuro sensory profile scores between group A & C and B & C multimodal coma stimulation is effective as compared to the control group.

Parle S (2016), conducted a study to assess the effectiveness direct and non auditory stimulation, In this nine participants who were comatose after a severe traumatic brain injury underwent direct and non-direct auditory stimulation. In direct auditory stimulation used higher level of interpersonal interaction between the patient and stimuli such as voices of family members, orientation by a nurse and familiar music.

Siruluck Kaewsriwong (2015),conducted a study to assess the effectiveness of sensory stimulation program by care givers, the participants were two persons with severe TBI and six of their care givers. They were recruited by purposive sampling from two tertiary hospitals located in Thailand. Inclusion criteria of the two participants were diagnosed by physician with severe TBI & findings demonstrated. That there were improvements to cognitive function as evidenced by observed responses and cognitive function assessment tools. The observation during a after provision provided more details regarding the responses to sensory stimuli close observation for reflexive and purpose responses of cognitive function has great potential to provide people with TBI. On addition nurse administrators can facilitate the development and implementation of sensory stimulation program clinical practice guidelines for persons with TBI.

Rader & Ellis (2004), The Sensory Stimulation Assessment Measure (SSAM) was designed to expand the GCS to standardize sensory presentation. The SSAM consists of fifteen items that assess each of four area: Visual, auditory olfactory and gustatory. This is a standardized tool with comprehensive instructions for administration and scoring. It was found by hall, Macdonald, and young that SSAM was able to detect difference in performance between phases of directed and non-directed sensory stimulation. CRS, WNSSP and SSAM scales all detect neuro behavioural changes. SSAM gives credit for response regardless of stimuli.

CHAPTER – III

METHODOLOGY

Methodology of research organizes all the components of study in a way that most likely will lead to valid answers for the problems that have been posted.

This chapter deals with the methodology adopted for the study. It includes research approach, design, variables, setting, population, and sample, criteria for sample selection, sampling technique, sample size, development and description of tool, content validity, pilot study, ethical considerations, data collection procedure and plan for data analysis.

RESEARCH APPROACH

The research approach used in the study was evaluative quantitative research approach

RESEARCH DESIGN

The research design adopted for the study was quantitative quasi experimental research design.

According to **Polit and Hungler (2007)** the schematic representation experimental study is shown below:

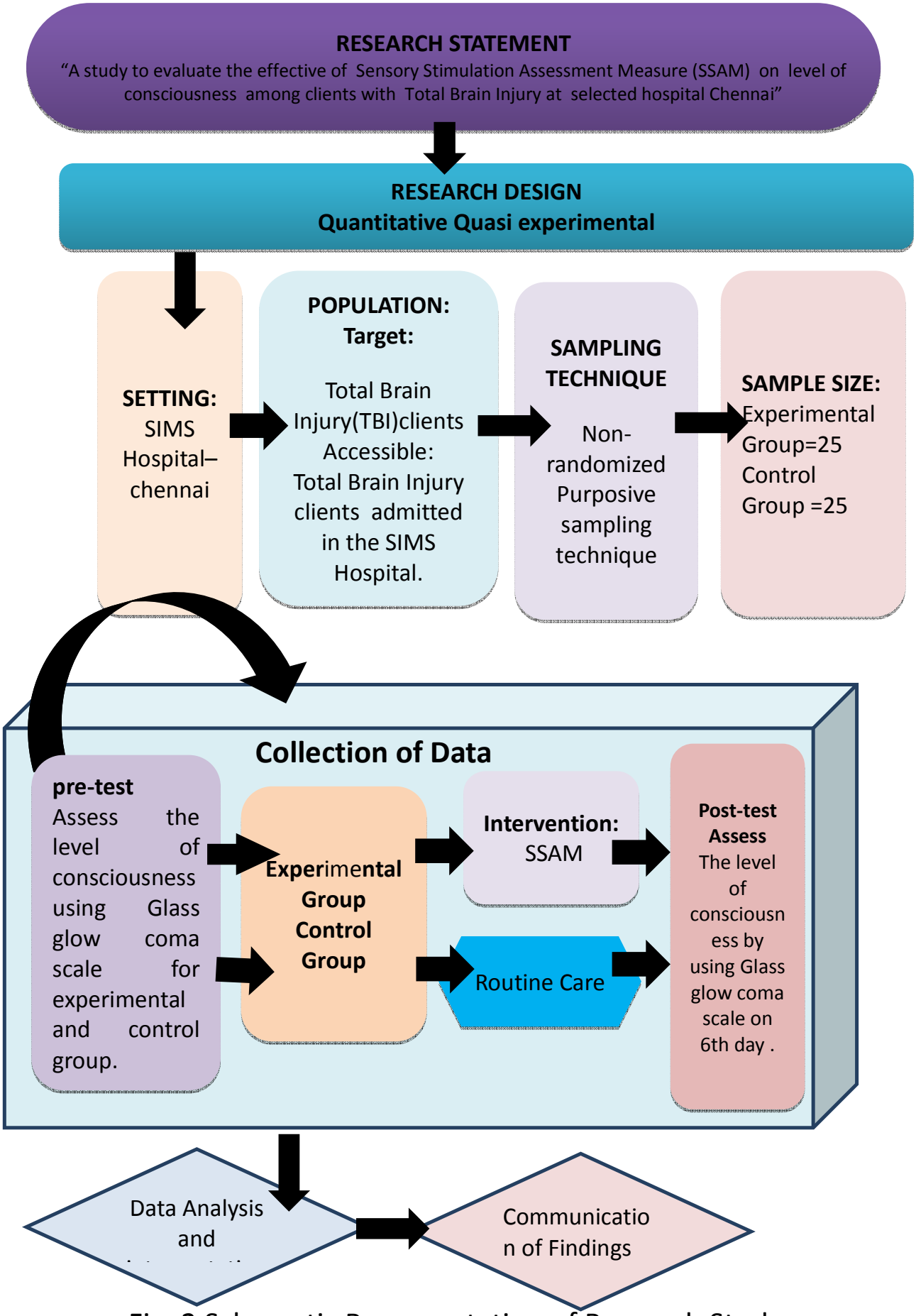


Fig: 2 Schematic Representation of Research Study

NONRANDOMIZATION	**Group**	**Pre test O_1**	**Intervention X**		**Post test O_2**
	Experimental group	Assessment of GCS for experimental group	SSAM will be administered with the three senses; visual, auditory, tactile) for 15 minutes twice a day for 6 days	After 6 days of intervention	Assessment of GCS after 6 days for experimental group
	Control group	Assessment of GCS for control group	Clients on routine care and regular medication therapy.	After 6 days	Assessment of GCS after 6 days for control group.

VARIABLES

The variables of the study are enlisted below:

Independent Variables

In this study independent variable is Sensory Stimulation Assessment Measure (SSAM) which includes Visual, Auditory, Tactile only.

Dependant Variables

Level of Consciousness

Demographic Variables

Age in years, sex, religion, marital status, educational qualification, occupation, Types of brain injury, Duration of hospital stay.

SETTING OF THE STUDY

The study was conducted in SIMS Hospital, Vadapalni, Chennai, which is an inpatient and outpatient setting of 150 patients got admitted in the trauma and emergency

ward per month. The hospital also specialization in trauma Care and Neuro rehabilitation. The corporation provides sophisticated amenities to care all type of brain injured clients with inbuilt emergency room, neuro ward and ICU.

POPULATION

Target Population:

The population for the study comprises of clients who were received in trauma and emergency care unit of hospital for the TBI nearly50 to 100 patients are undergoing in a month.

Accessible Population

Accessible population of the study comprises of Total Brain Injury (TBI) Clients with GCS of 7-10

SAMPLE

The study sample comprised of 50 clients diagnosed with TBI who satisfy the inclusive criteria of the study.

CRITERIA FOR SAMPLE COLLECTION

Inclusive Criteria:

1. Clients with medically diagnosed as TBI
2. Both male and female clients are included
3. Clients with GCS score of 7-10

Exclusive Criteria

1. Clients with GCS below 6
2. Clients with increased Intra cranial pressure
3. Clients on endo tracheal intubation
4. Clients with mechanical ventilator.

SAMPLE TECHNIQUE

Clients who fulfil the inclusive criteria were selected by purposive sampling technique.

SAMPLE SIZE

50 clients with Total Brain Injury (TBI) who fulfilled the inclusive criteria were selected for the study of this 25 each were allotted to the experimental and control group.

DEVELOPMENT AND DESCRIPTION OF THE TOOL

Considering the study the tool was constructed after extensive review of literature and discussion with experts. The tool to measure the pretest and post test level of consciousness was based on Glasgow coma scale which was used, and the demographic variables, was collected using questionnaires by interview method .The tool consist of 2 sections.

Section A: It consist of demographic data such as age in years, sex, religion, marital status, educational qualification, occupation, causes for hospitalization, Duration of hospital stay, Vital signs, Types of Brain injury, level of consciousness.

Section B: A standardized Glasgow coma used to assess the level of consciousness, which include aspects like

ASPECTS	ITEMS
Eye opening response	4
Verbal response	5
Motor response	6

The assessment aspects placed on a rating scale. The scale consist of 3 aspects of 15 items Total score is dived as

ASPECTS	SCORE	PERCENTAGE
Poor recovery	0-6	0-40%
Average recovery	7-12	46.6-80%
Good recovery	13-15	86.6-100%

Section C: Development of Intervention (SSAM) on level of consciousness

The following steps were adopted for the development of the intervention

1. Development of Criteria Check list.
2. Preparation of the first draft of intervention
3. Content Validation of the intervention
4. Pretesting of the intervention.

1. Development of Criteria Check list.

Criteria checklist (**Appendix M)** was prepared as a first step towards the development of a protocol about SSAM after reviewing the literature and consulting the expert .The areas included in the criteria checklist were the following :

- Selection of the content
- Organization of the content
- Presentation of the content

The criteria checklist included major criteria and sub criteria for which experts were asked to give their rating as "meets the criteria , "partially meets the criteria ,"does not meets the criteria "., " remarks " and "suggestions "(**Appendix L**).

2. Preparation of the first draft of the intervention,

The first draft of the protocol was prepared on the basis of criteria checklist, extensive review of literature and opinion of the experts.

Content Validity of the Intervention (SSAM)

The protocol of nursing intervention was established in consultations with the guide and experts from the field of medical surgical nursing ,neurologist and extensive review of literature (**Appendix L)**

Preparation of final draft of(SSAM) : The final draft of intervention was prepared after incorporating subject experts suggestions and consultations with guide .

Description of Intervention:

The intervention was titled as Sensory Stimulation Assessment Measure (SSAM),

- Definition
- Purpose
- Indication
- Contra indication
- Articles needed
- Procedure
- Post procedure care

Testing of the Tool:

The tool prepared for the data collection was tested for its content validity, feasibility and reliability

VALIDITY OF THE TOOL

To ensure the content validity the instrument was given to experts from different fields along with the blue print, objectives of the study and evaluation criteria checklist. Based on their suggestions modification were done.

RELIABILITY

The researcher has used the Glasgow coma scale to assess the level of consciousness in the present study. The reliability of the scale is r=0.978.

CONTENT VALIDITY

The content validity of the tool was obtained from five experts consisting of medical-surgical nursing experts, one medical neurologist, one medical expert from head of trauma care in emergency department, one medical expert from head of orthopaedic department, one from emergency and trauma care technician, one statistician. Their suggestion, guidance and modifications were incorporated .For the administration purpose the tool was translated into Tamil and was validated by Tamil teacher.

PILOT STUDY

Pilot study was conducted on 1-6-2017 to 6 -6-2017 among clients with Total brain injury (TBI) at SIMS Hospital ,SRM institute for Medical Sciences Vadapalani, Chennai, After obtaining formal permission ,The study was conducted among 10 TBI clients after obtaining permission from the concerned authority. The samples were

divided in experimental and control group and pre-test was taken from both group using GCS scale on the same day intervention was implemented to the experimental group where as to the routine care was implemented. The intervention was given 30 minutes twice a day for 6 consecutive days. The post test was conducted on the 6th day by using same Glasgow coma scale in experimental as well as control group.

The result of the study shown calculated paired t test value was 10.40,which was significantly found to be significant at 0.05 level.
The tool and SSAM proved to be feasible and practicable.

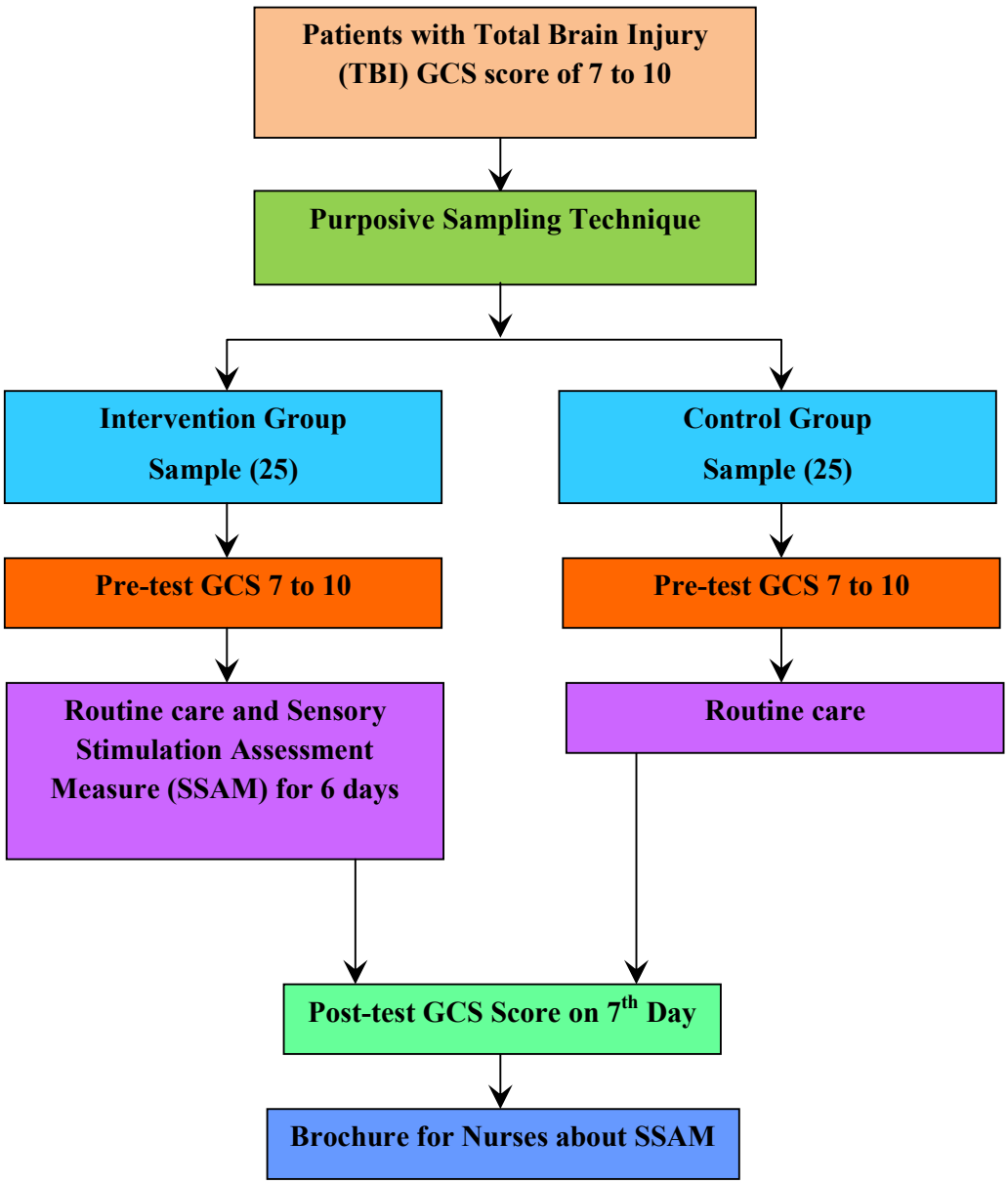
ETHICAL CONSIDERATION

The study was approved by Research approval Committee, obtained permission from the Principal of Indira College of Nursing and also from the setting of the study. Permission was obtained from the Director of SIMS Hospital and Director of neuro science .The details and purpose of the study was explained to the concerned persons and clients care taker. Written consent was obtained from the client's caretaker to proceed the study. Privacy was ensured during the procedure .Assurance was given to the clients caretaker that, confidentiality would be maintained and no self-harm will be inflicted. Clients were free to leave at any part of time during the study

DATA COLLECTION PROCEDURE

1. The written permission was obtained from the directors of selected hospital, Chennai prior to data collection. The data collection was done in month of June.
2. Informed consent was obtained from client care taker. Confidentiality was assured to all the client care takers.

DATA COLLECTION METHOD



PLAN FOR ANALYSIS

The collected data was analysed using both descriptive and inferential statistics.

Descriptive Statistics

1. Frequency and percentage distribution were used for analysis of socio demographic variables among clients with Total Brain Injury (TBI).

2. Mean and standard deviation was used to assess the level of consciousness among clients with Total Brain Injury (TBI).

Inferential Statistics

1. Paired ”t” test was used to compare the pre and post-test level of consciousness among clients with Total Brain Injury(TBI) in the experimental and control group.
2. Unpaired “t“ test was used to compare the pre and post test level of consciousness among clients with Total Brain Injury(TBI) between the experimental and control group.
3. Chi-square analysis was used to determine the association between demographic variable and level of consciousness among clients with Total Brain Injury (TBI) in the experimental and control group.

CHAPTER – IV

DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and interpretation of data collected from 50clients with Total Brain Injury at selected hospital, Chennai, to evaluate the effect of Sensory Stimulation Assessment Measure [SSAM] on level of Consciousness among clients with Total Brain Injury [TBI]. The data collected for the study was grouped and analyzed as per the objectives set for the study. The findings based on the descriptive and inferential statistical analysis are presented under the following sections.

ORGANIZATION OF DATA

The findings of the study were grouped and analyzed under the following sessions.

Section A: Description of the demographic variables.

Section B: Assessment of pretest and post test level of consciousness among clients with Total Brain Injury [TBI] in experimental and control group.

Section C: Effectiveness of Sensory Stimulation Assessment Measure [SSAM] on level of Consciousness among clients with Total Brain Injury [TBI] in experimental and control group.

Section D: Association of pretest and post test level of Consciousness among clients with Total Brain Injury [TBI] with their selected demographic variables in the experimental and control group.

SECTION A: DESCRIPTION & DISTRIBUTION OF THE DEMOGRAPHIC VARIABLES.

Table 1: Frequency and percentage distribution of demographic variables of clients with Total Brain Injury [TBI] in the experimental and control group. n = 50

Demographic Variables	Experimental n=25		Control n=25	
	n	%	n	%
Age in years				
21 - 30 years	4	16	4	16
31 - 40 years	3	12	7	28
41 - 50 years	2	8	1	4
51 years and above	16	64	13	52
Sex				
Male	20	80	20	80
Female	5	20	5	20
Marital status				
Married	5	20	4	16
Unmarried	20	80	21	84
Religion				
Hindu	21	84	20	80
Christian	3	12	3	12
Muslim	1	4	2	8
Others	0	0	0	0
Education				
Non-formal education	1	4	2	8
Primary education	2	8	4	16
Secondary education	8	32	6	24
Graduate	12	48	11	44
Post graduate	2	8	2	8
Occupation				
Unskilled	5	20	7	28
Semi skilled	4	16	6	24
Nonprofessional	11	44	8	32
Professional	5	20	4	16
Monthly family income				
Rs.6000	2	8	0	0
Rs.6001 – 16000	9	36	11	44
Rs.16001 – 30000	9	36	10	40
Rs.30,001 above	5	20	4	16
History of co-morbid illness				
Cardio vascular disease	5	20	10	40
Diabetes mellitus	5	20	1	4
Respiratory disease	1	4	1	4
Others	2	8	3	12
Nil	12	48	10	40

Demographic Variables	Experimental n=25		Control n=25	
	n	%	n	%
Current treatment of co-morbid illness				
Yes	10	40	13	52
No	15	60	12	48
Accompanying injuries				
No injuries	22	88	25	100
Limb fracture	3	12	0	0
Rib fracture	0	0	0	0
Cause for hospitalization				
Motor accident	14	56	7	28
Car accident	0	0	1	4
Fall	3	12	4	16
Others	8	32	13	52
Types of brain injury				
Subdural Haemorrhage	11	44	15	60
Intra Cranial Haemorrhage	6	24	7	28
Diffuse Axonal Injury	5	20	3	12
Mixed	3	12	0	0
Duration of hospital stay				
1 - 10 days	15	60	15	60
11 - 20 days	7	28	7	28
>31 days	3	12	3	12
Vital signs				
Stable	20	80	21	84
Unstable	5	20	4	16
Intra cranial pressure (ICP) variation				
7 - 9 mmHg	9	36	11	44
10 - 12 mmHg	14	56	6	24
13 - 15 mmHg	2	8	8	32
Level of consciousness				
GCS score 7	10	40	8	32
GCS score 8	9	36	7	28
GCS score 9	3	12	4	16
GCS score 10	3	12	6	24

The table 1 shows that in the experimental group, majority 16(64%) were in the age group of 51 years and above, 20(80%) were unmarried, 21(84%) were Hindus, 12(48%) were graduates, 11(44%) were Nonprofessional, 9(36%) were earning Monthly family income of Rs.6001 – 16000 and Rs.16001 – 30000 respectively, 12(48%) had no history of co-morbid illness, 15(60%) were not under treatment of co-morbid illness, 22(88%) had no accompanying injuries, 14(56%) were hospitalized due to motor accident, 11(44%) suffered

subdural haemorrhage type of brain injury, 15(60%) were staying in hospital for 1 – 10 days, 20(80%) had stable vital signs, 14(56%) had Intra cranial pressure (ICP) variation of 10 – 12 mmHg and 10(40%) had GCS score of 7.

Whereas in the control group, majority 13(52%) were in the age group of 51 years and above, 21(84%) were unmarried, 20(80%) were Hindus, 11(44%) were graduates, 8(32%) were Nonprofessional, 11(44%) were earning monthly family income of Rs.6001 – 16000, 10(40%) had cardio vascular disease and no history of co-morbid illness respectively, 13(52%) were under treatment of co-morbid illness, 25(100%) had no accompanying injuries, 13(52%) were hospitalized due to other reason, 15(60%) suffered subdural haemorrhage type of brain injury, 15(60%) were staying in hospital for 1 – 10 days, 21(84%) had normal vital signs, 11(44%) had intra cranial pressure (ICP) variation of 7 – 9 mmHg and 8(32%) had GCS score of 7.

n=50

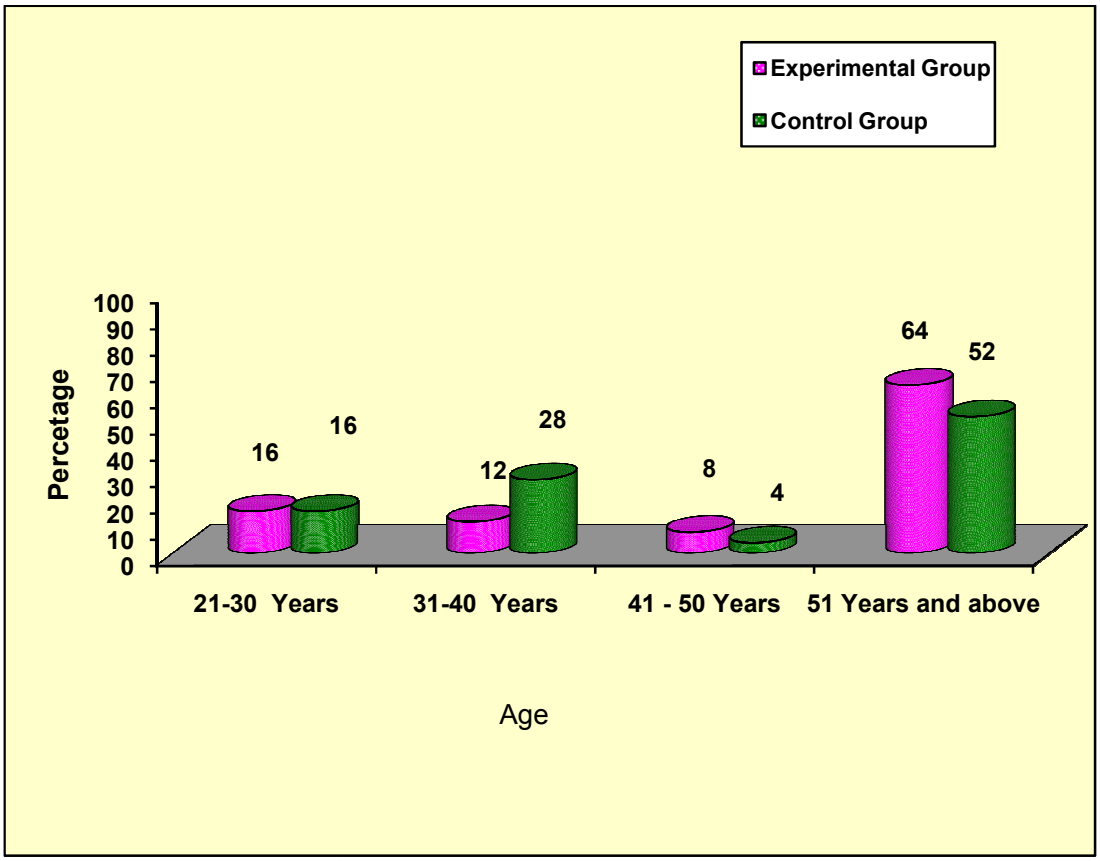


Fig.3: Percentage distribution of age of the clients with Total Brain Injury {TBI} in experimental and control group (n=50)

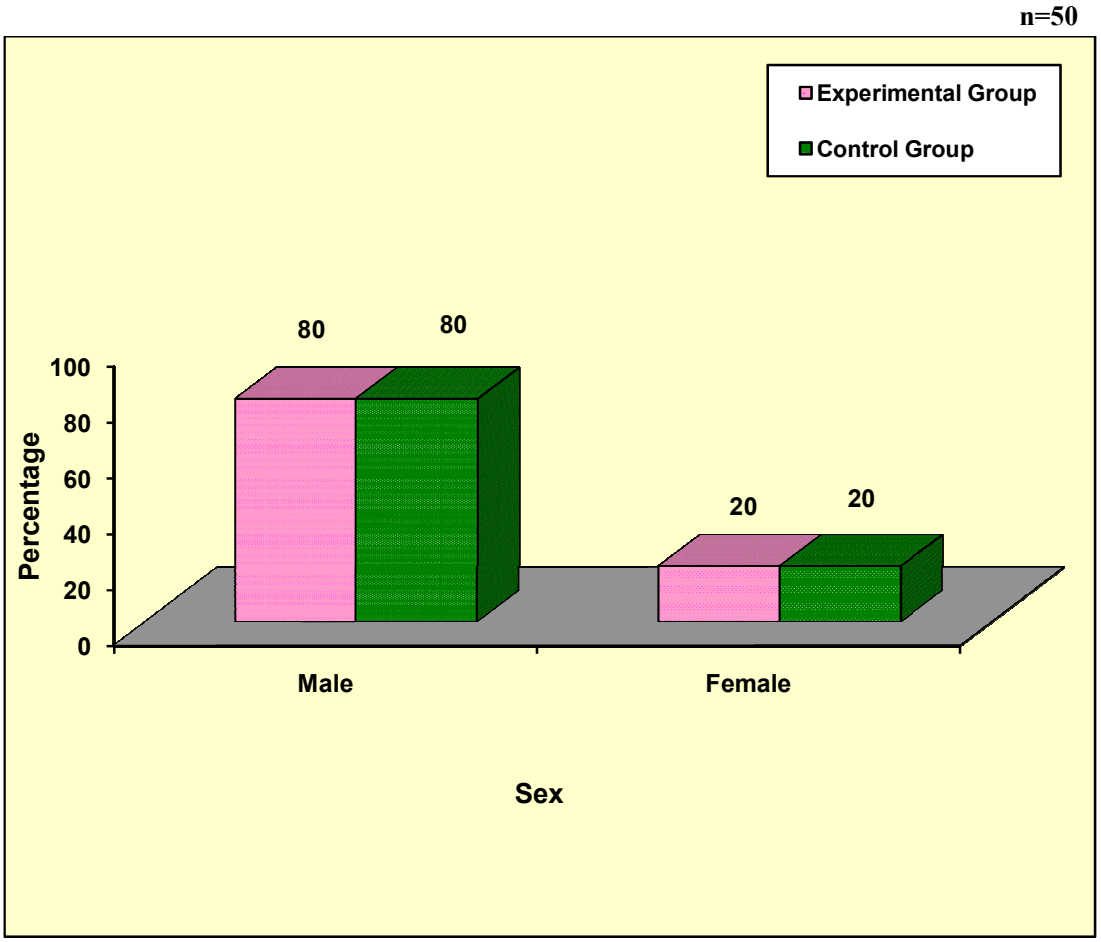


Fig.4: Percentage distribution of sex of the clients with Total Brain Injury {TBI} in experimental and control group (n=50)

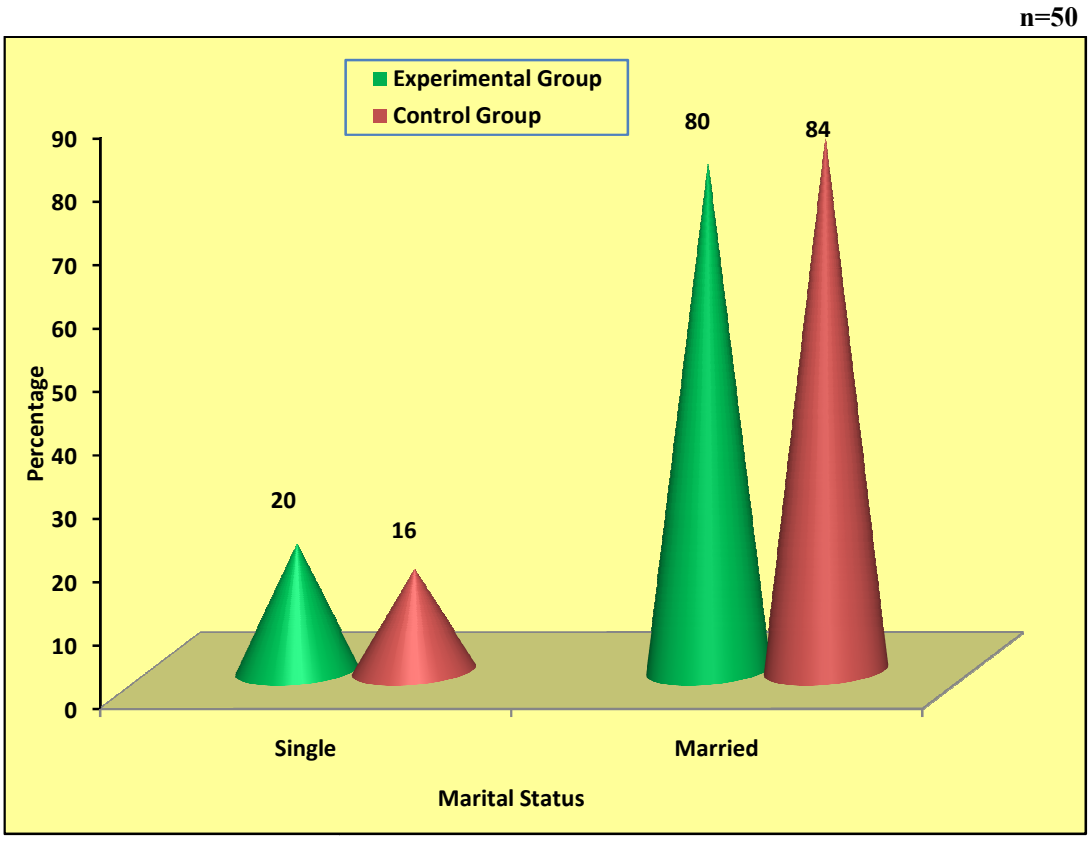


Fig.5: Percentage distribution of marital status of the clients with Total Brain Injury {TBI} in experimental and control group (n=50)

n=50

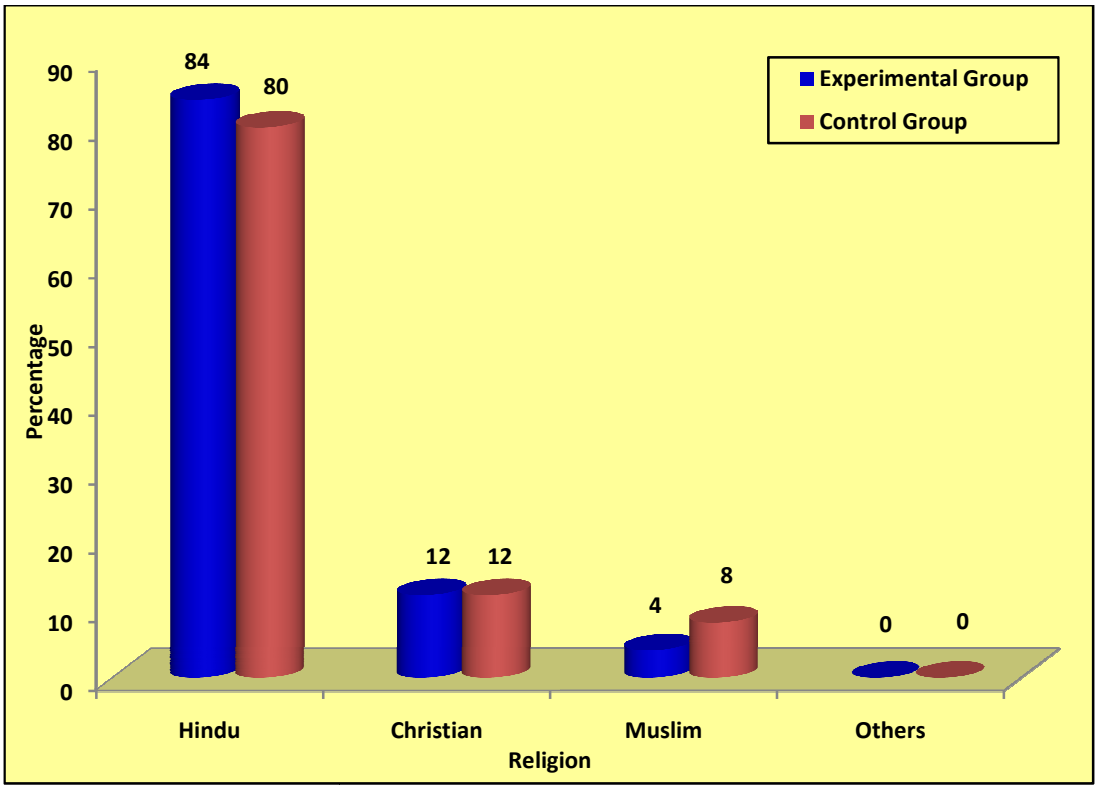


Fig.6: Percentage distribution of religion of the clients with Total Brain Injury {TBI} in experimental and control group (n=50)

n=50

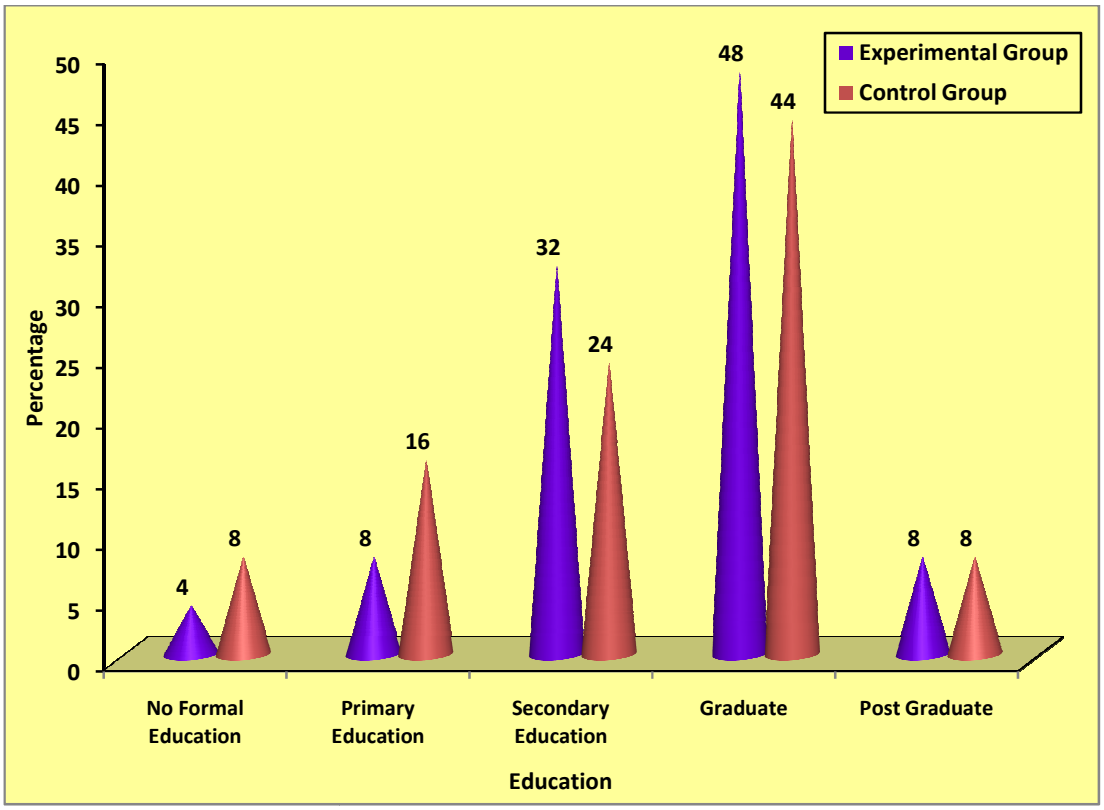


Fig.7: Percentage distribution of education of the clients with Total Brain Injury {TBI} in experimental and control group (n=50)

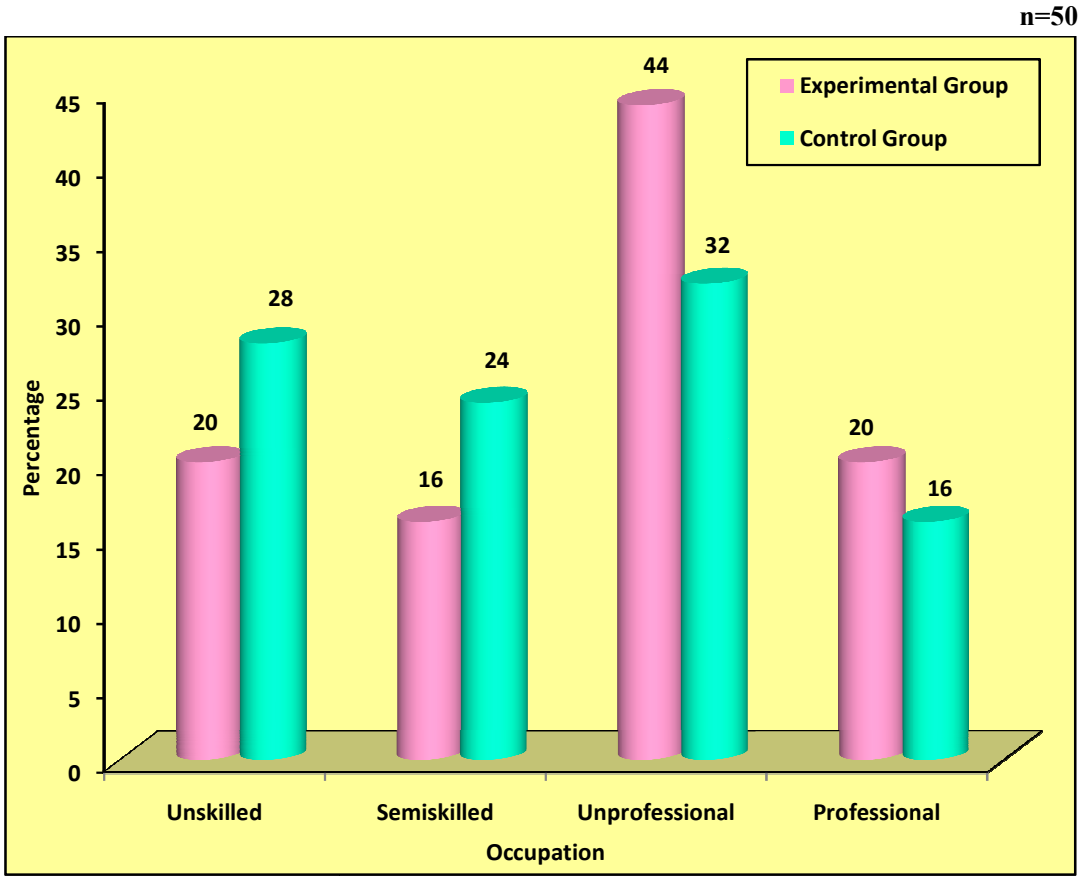


Fig.8: Percentage distribution of occupation of the clients with Total Brain Injury {TBI} in experimental and control group (n=50)

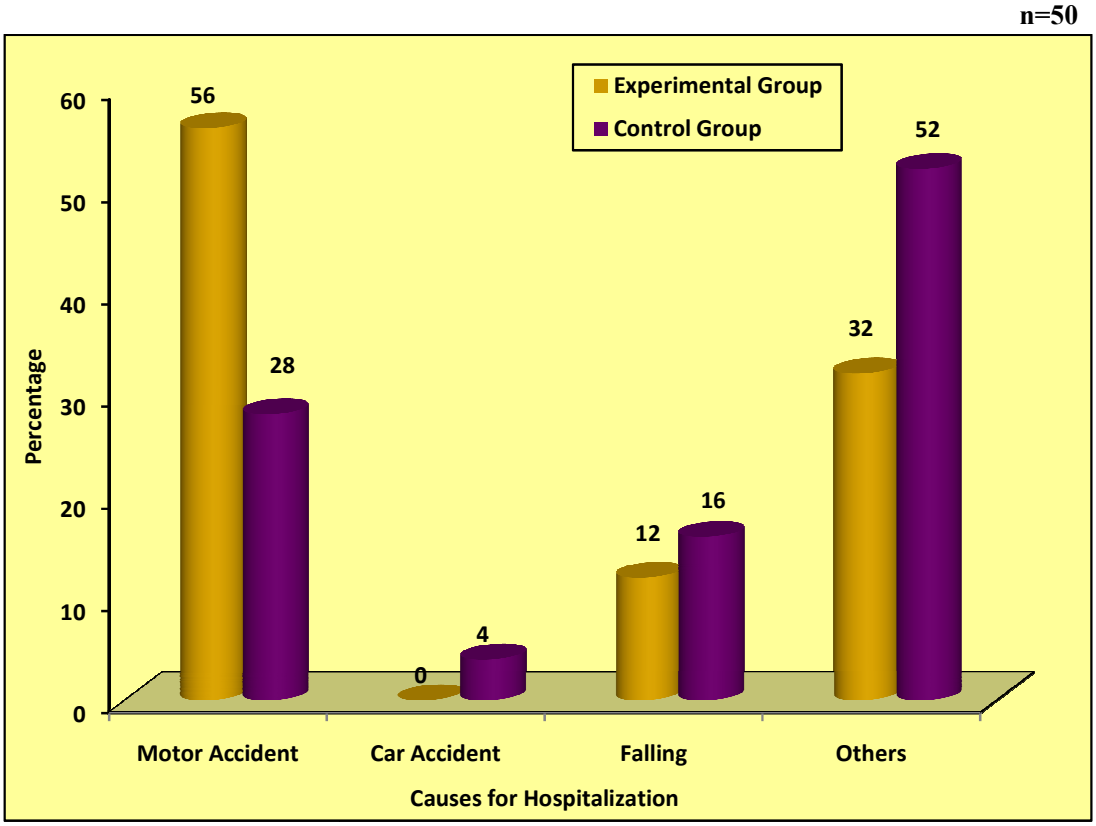


Fig.9: Percentage distribution of causes for hospitalization of the clients with Total Brain Injury {TBI} in experimental and control (n=50)

SECTION B: ASSESSMENT OF PRETEST AND POST TEST LEVEL OF CONSCIOUSNESS AMONG CLIENTS WITH TOTAL BRAIN INJURY [TBI] IN EXPERIMENTAL AND CONTROL GROUP.

Table 2: Frequency and percentage distribution of pretest and post test level of consciousness among clients with Total Brain Injury [TBI] in experimental group.

n= 25

Level of Consciousness	Poor Recovery (0 – 6)		Average Recovery (7 – 12)		Good Recovery (13 – 15)	
	n	%	n	%	n	%
Pretest	0	0	25	100.0	0	0
Post Test	0	0	18	72.0	7	28.0

The table 2 shows that in the pretest, almost all 25(100%) had average recovery whereas in the post test majority 18(72%) had average recovery and 7(28%) had good recovery.

n=25

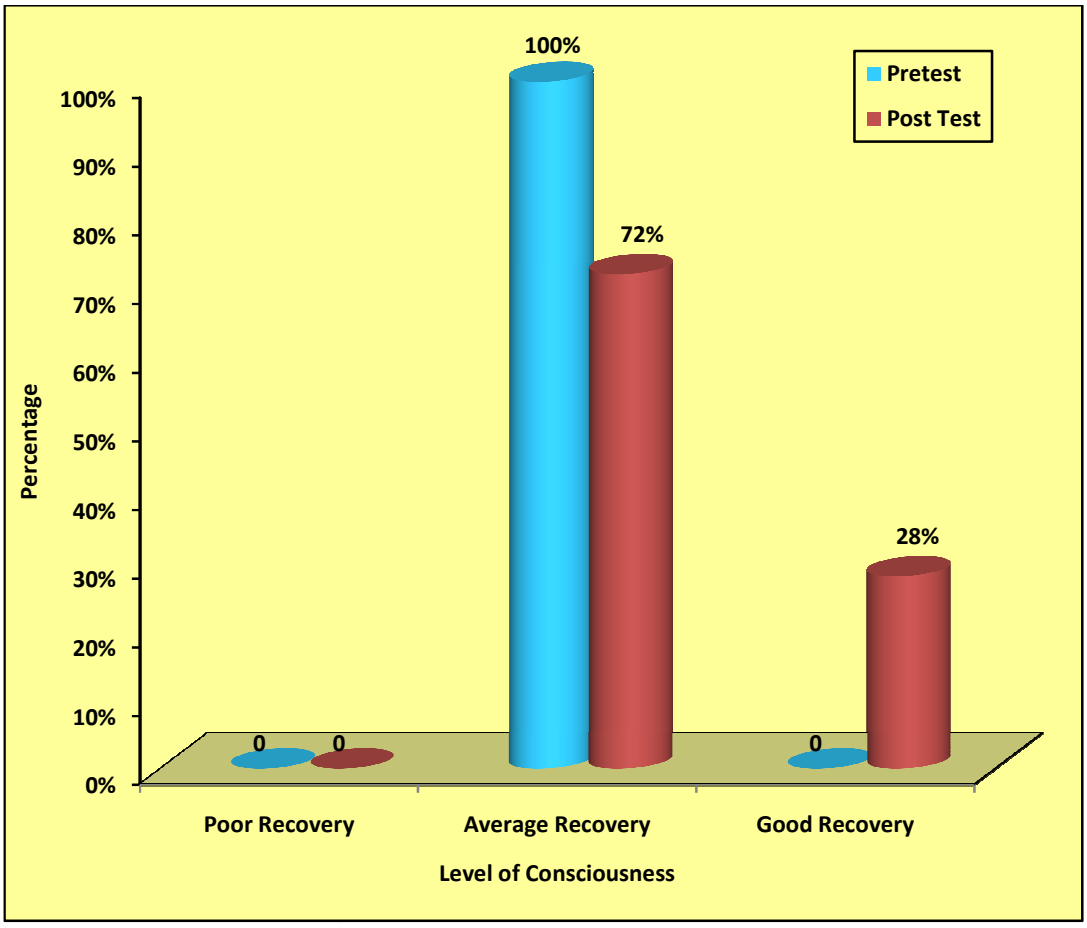


Fig.10: Percentage distribution of pretest and post test level of consciousness among clients with Total Brain Injury [TBI] in experimental group (n=25)

Table 3: Frequency and percentage distribution of pretest and post test level of consciousness among clients with Total Brain Injury [TBI] in control group.

n = 25

Level of Consciousness	Poor Recovery (0 – 6)		Average Recovery (7 – 12)		Good Recovery (13 – 15)	
	n	%	n	%	n	%
Pretest	0	0	25	100.0	0	0
Post Test	0	0	25	100.0	0	0

The table 3 shows that in the pretest, almost all 25(100%) had average recovery and also in the post test almost all 25(100%) had average recovery in the control group.

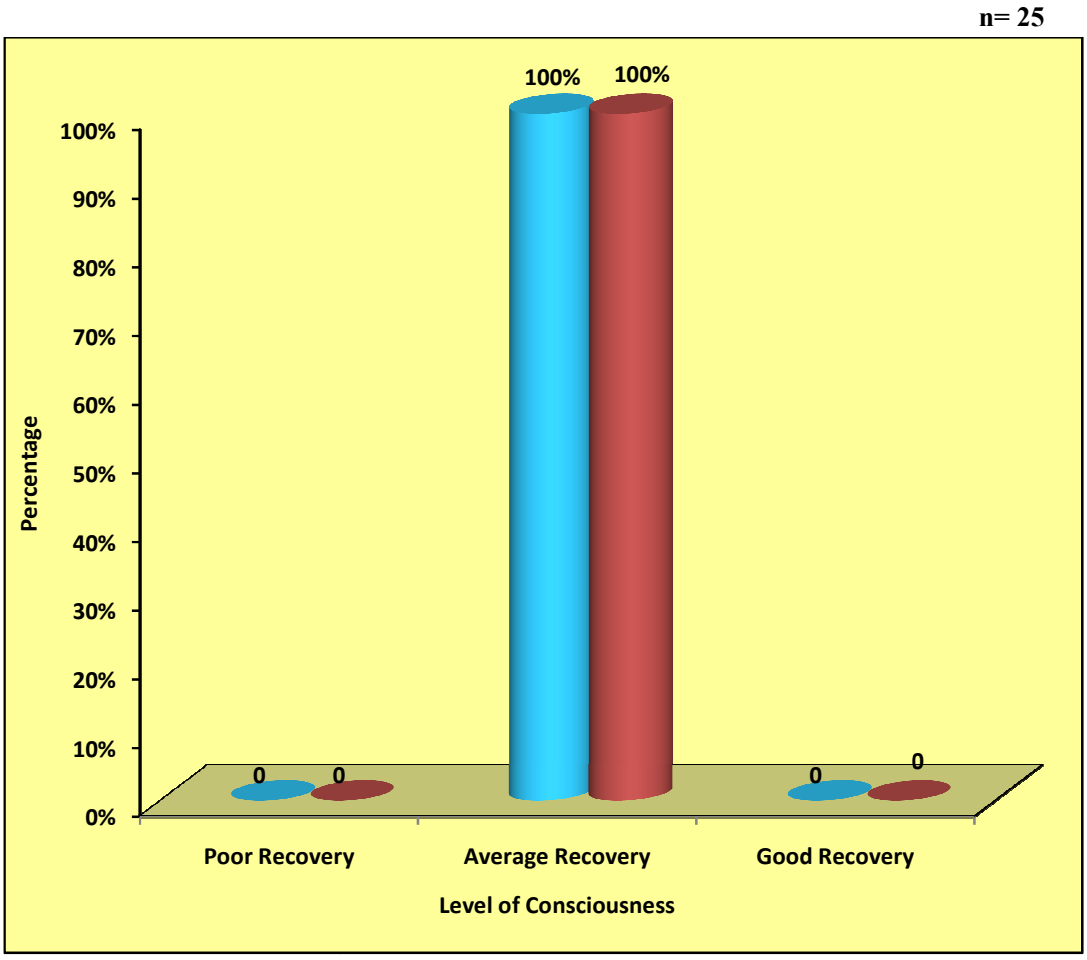


Fig.11: Percentage distribution of pretest and post test level of consciousness among clients with Total Brain Injury [TBI] in control group (n=25)

SECTION C:EFFECTIVENESS OF SENSORY STIMULATION ASSESSMENT MEASURE [SSAM] ON LEVEL OF CONSCIOUSNESS AMONG CLIENTS WITH TOTAL BRAIN INJURY [TBI] IN EXPERIMENTAL AND CONTROL GROUP.

Table 4: Comparison of pretest and post test level of consciousness score among clients with Total Brain Injury [TBI] in experimental group.

n = 25

Consciousness	Mean	S.D	Mean Difference	Paired 't' Value
Pretest	7.92	1.04	2.80	t = 7.483
Post Test	10.72	2.09		p = 0.0001, S

***p<0.001, S – Significant

The table 4 shows that in the pretest, the mean score of consciousness was 7.92 with S.D 1.04 whereas in the post test the mean score of consciousness was 10.72 with S.D 2.09. The calculated paired 't' value of t = 7.483 was found to be statistically significant at p<0.001 level. This clearly shows that the Sensory Stimulation Assessment Measure [SSAM] administered to the patients with Total Brain Injury [TBI} had significant improvement in the post test level of consciousness in the experimental group.

Table 5: Comparison of pretest and post test level of consciousness score among clients with Total Brain Injury [TBI] in control group.

n = 25

Consciousness	Mean	S.D	Mean Difference	Paired 't' Value
Pretest	8.32	1.18	0.08	t = 1.445
Post Test	8.40	1.26		p = 0.161, N.S

N.S – Not Significant

The table 5 shows that in the pretest, the mean score of consciousness was 8.32 with S.D 1.18 whereas in the post test the mean score of consciousness was 8.40 with S.D 1.26. The calculated paired 't' value of t = 1.445 was not found to be statistically significant at $p<0.05$ level. This clearly shows that there was no significant difference in the level of consciousness among patients with Total Brain Injury [TBI] in the control group who had undergone normal hospital routine measures.

Table 6: Comparison of pretest level of consciousness score among clients with Total Brain Injury [TBI] between the experimental and control group.

n= 50(25+25)

Consciousness	Mean	S.D	Mean Difference	Unpaired 't' Value
Experimental	7.92	1.03	0.40	t = 1.273
Control	8.32	1.18		p = 0.209, N.S

N.S – Not Significant

The table 6 shows that in the pretest, the mean score of consciousness in the experimental group was 7.92 with S.D 1.03 whereas in the control group the mean score of consciousness was 8.32 with S.D 1.18. The calculated unpaired 't' value of t = 1.273 was not found to be statistically significant at $p<0.05$ level. This clearly shows that there was no significant difference in the pretest level of consciousness among patients with Total Brain Injury [TBI] between the experimental and control group.

Table 7: Comparison of post test level of consciousness score among clients with Total Brain Injury [TBI] between the experimental and control group.

n = 50(25+25)

Consciousness	Mean	S.D	Mean Difference	Unpaired 't' Value
Experimental	10.72	2.09	2.32	t = 4.752***
Control	8.40	1.26		p = 0.0001, S

***p<0.001, S – Significant

The table 7 shows that in the post test, the mean score of consciousness in the experimental group was 10.72 with S.D 2.09 whereas in the control group the mean score of consciousness was 8.40 with S.D 1.26. The calculated unpaired 't' value of t = 4.752 was found to be statistically significant at p<0.001 level. This clearly shows that there was significant difference in the post test level of consciousness among patients with Total Brain Injury [TBI] between the experimental and control group which clearly indicates that Sensory Stimulation Assessment Measure [SSAM] administered to the patients with Total Brain Injury [TBI} had significant improvement in the post test level of consciousness in the experimental group than the patients in the control group who had undergone normal hospital routine measures.

SECTION D:ASSOCIATION OF PRETEST AND POST TEST LEVEL OF CONSCIOUSNESS AMONG CLIENTS WITH TOTAL BRAIN INJURY [TBI] WITH THEIR SELECTED DEMOGRAPHIC VARIABLES IN THE EXPERIMENTAL AND CONTROL GROUP.

Table 8: Association of pretest level of consciousness among clients with Total Brain Injury {TBI} with their selected demographic variables in the experimental group.

n = 25

Demographic Variables	Average Recovery (7 – 12)		Good Recovery (13 – 15)		Chi-Square Value
	n	%	n	%	
Age in years					χ^2=1.241 d.f=3 p = 0.743 N.S
21 - 30 years	1	4.0	3	12.0	
31 - 40 years	2	8.0	1	4.0	
41 - 50 years	1	4.0	1	4.0	
51 years and above	7	28.0	9	36.0	
Sex					χ^2=0.649 d.f=1 p = 0.420 N.S
Male	8	32.0	12	48.0	
Female	3	12.0	2	8.0	
Marital status					**χ^2=4.911 d.f=1 p = 0.027 S***
Married	0	0	5	20.0	
Unmarried	11	44.0	9	36.0	
Religion					χ^2=1.422 d.f=2 p = 0.491 N.S
Hindu	9	36.0	12	48.0	
Christian	2	8.0	1	4.0	
Muslim	0	0	1	4.0	
Others	-	-	-	-	
Education					χ^2=3.186 d.f=4 p = 0.527 N.S
Non-formal education	1	4.0	0	0	
Primary education	0	0	2	8.0	
Secondary education	3	12.0	5	20.0	
Graduate	6	24.0	6	24.0	
Post graduate	1	4.0	1	4.0	
Occupation					χ^2=1.895 d.f=3 p = 0.597 N.S
Unskilled	3	12.0	2	8.0	
Semi skilled	1	4.0	3	12.0	
Nonprofessional	4	16.0	7	28.0	
Professional	3	12.0	2	8.0	

Demographic Variables	Average Recovery (7 – 12)		Good Recovery (13 – 15)		Chi-Square Value
	n	%	n	%	
Monthly family income					χ^2=4.619 d.f=3 p = 0.202 N.S
Rs.6000	0	0	2	8.0	
Rs.6001 - 16000	4	16.0	5	20.0	
Rs.16001 - 30000	3	12.0	6	24.0	
Rs.30,001 above	4	16.0	1	4.0	
History of co-morbid illness					χ^2=4.640 d.f=4 p = 0.326 N.S
Cardio vascular disease	1	4.0	4	16.0	
Diabetes mellitus	4	16.0	1	4.0	
Respiratory disease	0	0	1	4.0	
Others	1	4.0	1	4.0	
Nil	5	20.0	7	28.0	
Current treatment of co-morbid illness					χ^2=0.108 d.f=1 p = 0.742 N.S
Yes	4	16.0	6	24.0	
No	7	28.0	8	32.0	
Accompanying injuries					χ^2=2.679 d.f=1 p = 0.102 N.S
No injuries	11	44.0	11	44.0	
Limb fracture	0	0	3	12.0	
Rib fracture	-	-	-	-	
Cause for hospitalization					χ^2=2.679 d.f=2 p = 0.262 N.S
Motor accident	7	28.0	7	28.0	
Car accident	-	-	-	-	
Fall	0	0	3	12.0	
Others	4	16.0	4	16.0	
Types of brain injury					χ^2=0.945 d.f=3 p = 0.815 N.S
Subdural Haemorrhage	6	24.0	5	20.0	
Intra Cranial Haemorrhage	2	8.0	4	16.0	
Diffuse Axonal Injury	2	8.0	3	12.0	
Mixed	1	4.0	2	8.0	
Duration of hospital stay					χ^2=0.727 d.f=2 p = 0.695 N.S
1 - 10 days	6	24.0	9	36.0	
11 - 20 days	3	12.0	4	16.0	
>31 days	2	8.0	1	4.0	
Vital signs					χ^2=0.041 d.f=1 p = 0.840 N.S
Stable	9	36.0	11	44.0	
Unstable	2	8.0	3	12.0	

Demographic Variables	Average Recovery (7 – 12)		Good Recovery (13 – 15)		Chi-Square Value
	n	%	n	%	
Intra cranial pressure (ICP) variation					χ^2=2.067
7 - 9 mmHg	5	20.0	4	16.0	d.f=2
10 - 12 mmHg	6	24.0	8	32.0	p = 0.356
13 - 15 mmHg	0	0	2	8.0	N.S
Level of consciousness					**χ^2=21.392**
GCS score 7	12	48.0	0	0	**d.f=3**
GCS score 8	1	4.0	8	32.0	**p = 0.0001**
GCS score 9	0	0	3	12.0	**S*** **
GCS score 10	0	0	3	12.0	

***p<0.001, *p<0.05, S – Significant, N.S – Not Significant

The table 8 shows that the demographic variables marital status and level of consciousness had shown statistically significant association with pretest level of consciousness among clients with Total Brain Injury {TBI} in the experimental group at p<0.05 level and p<0.001 level respectively and the other demographic and clinical variables had not shown statistically significant association with pretest level of consciousness among clients with Total Brain Injury [TBI] in the experimental group

Table 9: Association of post test level of consciousness among clients with Total Brain Injury {TBI} with their selected demographic variables in the experimental group. **n = 25**

Demographic Variables	Average Recovery (7 – 12)		Good Recovery (13 – 15)		Chi-Square Value
	n	%	n	%	
Age in years					**χ^2=10.080 d.f=3 p = 0.018 S***
21 - 30 years	0	0	4	16.0	
31 - 40 years	3	12.0	0	0	
41 - 50 years	2	8.0	0	0	
51 years and above	11	44.0	5	20.0	
Sex					χ^2=1.563 d.f=1 p = 0.211 N.S
Male	14	56.0	6	24.0	
Female	2	8.0	3	12.0	
Marital status					χ^2=0.043 d.f=1 p = 0.835 N.S
Married	3	12.0	2	8.0	
Unmarried	13	52.0	7	28.0	
Religion					**χ^2=6.399 d.f=2 p = 0.041 S***
Hindu	15	60.0	6	24.0	
Christian	0	0	3	12.0	
Muslim	1	4.0	0	0	
Others	-	-	-	-	
Education					χ^2=3.118 d.f=4 p = 0.538 N.S
Non-formal education	0	0	1	4.0	
Primary education	1	4.0	1	4.0	
Secondary education	5	20.0	3	12.0	
Graduate	8	32.0	4	16.0	
Post graduate	2	8.0	0	0	
Occupation					χ^2=2.016 d.f=3 p = 0.569 N.S
Unskilled	2	8.0	3	12.0	
Semi skilled	3	12.0	1	4.0	
Nonprofessional	7	28.0	4	16.0	
Professional	4	16.0	1	4.0	
Monthly family income					χ^2=4.360 d.f=3 p = 0.225 N.S
Rs.6000	0	0	2	8.0	
Rs.6001 - 16000	6	24.0	3	12.0	
Rs.16001 - 30000	7	28.0	2	8.0	
Rs.30,001 above	3	12.0	2	8.0	

Demographic Variables	Average Recovery (7 – 12)		Good Recovery (13 – 15)		Chi-Square Value
	n	%	n	%	
History of co-morbid illness					χ^2=2.648 d.f=4 p = 0.618 N.S
Cardio vascular disease	3	12.0	2	8.0	
Diabetes mellitus	2	8.0	3	12.0	
Respiratory disease	1	4.0	0	0	
Others	1	4.0	1	4.0	
Nil	9	36.0	3	12.0	
Current treatment of co-morbid illness					χ^2=0.116 d.f=1 p = 0.734 N.S
Yes	6	24.0	4	16.0	
No	10	40.0	5	20.0	
Accompanying injuries					χ^2=0.011 d.f=1 p = 0.918 N.S
No injuries	14	56.0	8	32.0	
Limb fracture	2	8.0	1	4.0	
Rib fracture	-	-	-	-	
Cause for hospitalization					χ^2=1.568 d.f=2 p = 0.457 N.S
Motor accident	10	40.0	4	16.0	
Car accident	-	-	-	-	
Fall	1	4.0	2	8.0	
Others	5	20.0	3	12.0	
Types of brain injury					χ^2=1.076 d.f=3 p = 0.783 N.S
Subdural haemorrhage	7	28.0	4	16.0	
Intra Cranial Haemorrhage	3	12.0	3	12.0	
Diffuse Axonal Injury	4	16.0	1	4.0	
Mixed	2	8.0	1	4.0	
Duration of hospital stay					χ^2=2.596 d.f=2 p = 0.273 N.S
1 - 10 days	8	32.0	7	28.0	
11 - 20 days	5	20.0	2	8.0	
>31 days	3	12.0	0	0	
Vital signs					χ^2=0.694 d.f=1 p = 0.405 N.S
Stable	12	48.0	8	32.0	
Unstable	4	16.0	1	4.0	
Intra cranial pressure (CFP) variation					χ^2=0.784 d.f=2 p = 0.676 N.S
7 - 9 mmHg	5	20.0	4	16.0	
10 - 12 mmHg	10	40.0	4	16.0	
13 - 15 mmHg	1	4.0	1	4.0	

Demographic Variables	Average Recovery (7 – 12)		Good Recovery (13 – 15)		Chi-Square Value
	n	%	n	%	
Level of consciousness					χ^2=6.481 d.f=3 p = 0.090 N.S
GCS score 7	8	32.0	2	8.0	
GCS score 8	6	24.0	3	12.0	
GCS score 9	2	8.0	1	4.0	
GCS score 10	0	0	3	12.0	

*p<0.05, S – Significant, N.S – Not Significant

The table 9 shows that the demographic variables age and religion had shown statistically significant association with post test level of consciousness among clients with Total Brain Injury {TBI} in the experimental group at p<0.05 level and the other demographic and clinical variables had not shown statistically significant association with post test level of consciousness among clients with Total Brain Injury [TBI] in the experimental group.

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Table 10: Association of pretest level of consciousness among clients with Total Brain Injury {TBI} with their selected demographic variables in the control group. n = 25

Demographic Variables	<Mean		>Mean		Chi-Square Value
	n	%	n	%	
Age in years					χ^2=2.060 d.f=3 p = 0.560 N.S
21 - 30 years	2	8.0	2	8.0	
31 - 40 years	5	20.0	2	8.0	
41 - 50 years	0	0	1	4.0	
51 years and above	8	32.0	5	20.0	
Sex					χ^2=1.042 d.f=1 p = 0.307 N.S
Male	11	44.0	9	36.0	
Female	4	16.0	1	4.0	
Marital status					χ^2=0.198 d.f=1 p = 0.656 N.S
Married	2	8.0	2	8.0	
Unmarried	13	52.0	8	32.0	
Religion					χ^2=2.292 d.f=2 p = 0.318 N.S
Hindu	11	44.0	9	36.0	
Christian	3	12.0	0	0	
Muslim	1	4.0	1	4.0	
Others	-	-	-	-	
Education					χ^2=3.630 d.f=4 p = 0.458 N.S
Non-formal education	1	4.0	1	4.0	
Primary education	3	12.0	1	4.0	
Secondary education	4	16.0	2	8.0	
Graduate	7	28.0	4	16.0	
Post graduate	0	0	2	8.0	
Occupation					χ^2=0.322 d.f=3 p = 0.956 N.S
Unskilled	4	16.0	3	12.0	
Semi skilled	4	16.0	2	8.0	
Nonprofessional	5	20.0	3	12.0	
Professional	2	8.0	2	8.0	
Monthly family income					χ^2=0.227 d.f=3 p = 0.893 N.S
Rs.6000	-	-	-	-	
Rs.6001 - 16000	7	28.0	4	16.0	
Rs.16001 - 30000	6	24.0	4	16.0	
Rs.30,001 above	2	8.0	2	8.0	
History of co-morbid illness					χ^2=3.472 d.f=4 p = 0.482 N.S
Cardio vascular disease	7	28.0	3	12.0	
Diabetes mellitus	0	0	1	4.0	
Respiratory disease	1	4.0	0	0	
Others	1	4.0	2	8.0	
Nil	6	24.0	4	16.0	

Demographic Variables	<Mean		>Mean		Chi-Square Value
	n	%	n	%	
Current treatment of co-morbid illness					χ^2=0.027 d.f=1 p = 0.870 N.S
Yes	8	32.0	5	20.0	
No	7	28.0	5	20.0	
Accompanying injuries					-
No injuries	15	60.0	10	40.0	
Limb fracture	-	-	-	-	
Rib fracture	-	-	-	-	
Cause for hospitalization					χ^2=6.227 d.f=3 p = 0.101 N.S
Motor accident	5	20.0	2	8.0	
Car accident	1	4.0	0	0	
Fall	4	16.0	0	0	
Others	5	20.0	8	32.0	
Types of brain injury					χ^2=1.190 d.f=2 p = 0.551 N.S
Subdural haemorrhage	10	40.0	5	20.0	
Intra Cranial Haemorrhage	3	12.0	4	16.0	
Diffuse Axonal Injury	2	8.0	1	4.0	
Mixed	-	-	-	-	
Duration of hospital stay					χ^2=3.095 d.f=2 p = 0.213 N.S
1 - 10 days	8	32.0	7	28.0	
11 - 20 days	6	24.0	1	4.0	
>31 days	1	4.0	2	8.0	
Vital signs					χ^2=3.175 d.f=1 p = 0.075 N.S
Stable	11	44.0	10	40.0	
Unstable	4	16.0	0	0	
Intra cranial pressure (CFP) variation					χ^2=2.352 d.f=2 p = 0.309 N.S
7 - 9 mmHg	5	20.0	6	24.0	
10 - 12 mmHg	5	20.0	1	4.0	
13 - 15 mmHg	5	20.0	3	12.0	
Level of consciousness					**χ^2=25.000 d.f=3 p = 0.0001 S*** **
GCS score 7	8	32.0	0	0	
GCS score 8	7	28.0	0	0	
GCS score 9	0	0	4	16.0	
GCS score 10	0	0	6	24.0	

***p<0.001, S – Significant, N.S – Not Significant

The table 10 shows that the clinical variable level of consciousness had shown statistically significant association with pretest level of consciousness among clients with Total Brain Injury {TBI} in the control group at p<0.001 level and the demographic variables and other clinical variables had not shown statistically significant association with pretest level of consciousness among clients with Total Brain Injury [TBI] in the control group.

`Table 11: Association of post test level of consciousness among clients with Total Brain Injury {TBI} with their selected demographic variables in the control group. n = 25

Demographic Variables	<Mean		>Mean		Chi-Square Value
	n	%	n	%	
Age in years					χ^2=2.032 d.f=3 p = 0.566 N.S
21 - 30 years	2	8.0	2	8.0	
31 - 40 years	5	20.0	2	8.0	
41 - 50 years	0	0	1	4.0	
51 years and above	7	28.0	6	24.0	
Sex					χ^2=1.461 d.f=1 p = 0.227 N.S
Male	10	40.0	10	40.0	
Female	4	16.0	1	4.0	
Marital status					χ^2=0.070 d.f=1 p = 0.792 N.S
Married	2	8.0	2	4.0	
Unmarried	12	48.0	9	36.0	
Religion					χ^2=4.911 d.f=2 p = 0.086 N.S
Hindu	11	44.0	9	36.0	
Christian	3	12.0	0	0	
Muslim	0	0	2	8.0	
Others	-	-	-	-	
Education					χ^2=6.214 d.f=4 p = 0.184 N.S
Non-formal education	0	0	2	8.0	
Primary education	3	12.0	1	4.0	
Secondary education	4	16.0	2	4.0	
Graduate	7	28.0	4	16.0	
Post graduate	0	0	2	8.0	
Occupation					χ^2=0.963 d.f=3 p = 0.810 N.S
Unskilled	3	12.0	4	16.0	
Semi skilled	4	16.0	2	8.0	
Nonprofessional	5	20.0	3	12.0	
Professional	2	8.0	2	8.0	
Monthly family income					χ^2=0.465 d.f=2 p = 0.793 N.S
Rs.6000	-	-	-	-	
Rs.6001 – 16000	7	28.0	4	16.0	
Rs.16001 – 30000	5	20.0	5	20.0	
Rs.30,001 above	2	8.0	2	8.0	
History of co-morbid illness					χ^2=2.814 d.f=4 p = 0.589 N.S
Cardio vascular disease	6	24.0	4	16.0	
+Diabetes mellitus	0	0	1	4.0	
Respiratory disease	1	4.0	0	0	
Others	1	4.0	2	8.0	
Nil	6	24.0	4	16.0	

Demographic Variables	<Mean		>Mean		Chi-Square Value
	n	%	n	%	
Current treatment of co-morbid illness					χ^2=0.051 d.f=1 p = 0.821 N.S
Yes	7	28.0	6	24.0	
No	7	28.0	5	20.0	
Accompanying injuries					-
No injuries	14	56.0	11	44.0	
Limb fracture	-	-	-	-	
Rib fracture	-	-	-	-	
Cause for hospitalization					**χ^2=7.963 d.f=3 p = 0.047 S***
Motor accident	5	20.0	2	8.0	
Car accident	1	4.0	0	0	
Fall	4	16.0	0	0	
Others	4	16.0	9	36.0	
Types of brain injury					χ^2=0.727 d.f=2 p = 0.695 N.S
Subdural haemorrhage	9	36.0	6	24.0	
Intra Cranial Haemorrhage	3	12.0	4	16.0	
Diffuse Axonal Injury	2	8.0	1	4.0	
Mixed	-	-	-	-	
Duration of hospital stay					χ^2=3.664 d.f=2 p = 0.160 N.S
1 - 10 days	7	28.0	8	32.0	
11 - 20 days	6	24.0	1	4.0	
>31 days	1	4.0	3	12.0	
Vital signs					χ^2=3.741 d.f=1 p = 0.053 N.S
Stable	10	40.0	11	44.0	
Unstable	4	16.0	0	0	
Intra cranial pressure (CFP) variation					χ^2=3.678 d.f=2 p = 0.159 N.S
7 - 9 mmHg	4	16.0	7	28.0	
10 - 12 mmHg	5	20.0	1	4.0	
13 - 15 mmHg	5	20.0	3	12.0	
Level of consciousness					**χ^2=21.521 d.f=3 p = 0.0001 S*****
GCS score 7	8	32.0	0	0	
GCS score 8	6	24.0	1	4.0	
GCS score 9	0	0	4	16.0	
GCS score 10	0	0	6	24.0	

***p<0.001, S – Significant, N.S – Not Significant

The table 11 shows that the clinical variables causes of hospitalization and level of consciousness had shown statistically significant association with post test level of consciousness among clients with Total Brain Injury {TBI} in the control group at p<0.05 and p<0.001 level respectively and the demographic variables and other clinical variables had not shown statistically significant association with post test level of consciousness among clients with Total Brain Injury [TBI] in the control group.

CHAPTER – V

DISCUSSION

This chapter discusses in detail the findings of the study derived from the statistical analysis and its pertinence to the objectives of the study and further discussion will exemplify these objectives were satisfied by the study. The purpose of the study was to evaluate the effect of Sensory Stimulation Assessment Measure [SSAM] on level of Consciousness among clients with Total Brain Injury [TBI] at selected hospital, Chennai.

The findings of the study discussed were based on the objectives as stated.

Description of the demographic variables.

With regard to the demographic variables in the experimental group, majority 16(64%) were in the age group of 51 years and above, 20(80%) were unmarried, 21(84%) were Hindus, 12(48%) were graduates, 11(44%) were unprofessional, 9(36%) were earning Monthly income of Rs.6001 – 16000 and Rs.16001 – 30000 respectively, 12(48%) had no history of co-morbid illness, 15(60%) were not under treatment of co-morbid illness, 22(88%) had no accompanying injuries, 14(56%) were hospitalized due to motor accident, 11(44%) suffered subdural haemorrhage type of brain injury, 15(60%) were staying in hospital for 1 – 10 days, 20(80%) had normal vital signs, 14(56%) had intra cranial pressure (CFP) variation of 10 – 12 mmHg and 10(40%) had GCS score of 7.

Whereas in the control group, majority 13(52%) were in the age group of 51 years and above, 21(84%) were unmarried, 20(80%) were Hindus, 11(44%) were graduates, 8(32%) were Nonprofessional, 11(44%) were earning family monthly income of Rs.6001 – 16000, 10(40%) had cardio vascular disease and no history of co-morbid illness respectively, 13(52%) were under treatment of co-morbid illness, 25(100%) had no accompanying injuries, 13(52%) were hospitalized due to other reason, 15(60%) suffered subdural haemorrhage type of brain injury, 15(60%) were staying in hospital for 1 – 10 days, 21(84%) had normal vital signs, 11(44%) had intra cranial pressure (CFP) variation of 7 – 9 mmHg and 8(32%) had GCS score of 7.

The first objective was to assess the pre and post-test level of consciousness among clients with Total Brain Injury (TBI) in the experimental and control group.

Findings of pre test analysis revealed that in the pretest, almost all 25(100%) had average recovery whereas in the post test majority 18(72%) had average recovery and 7(28%) had good recovery in the experimental group.

The analysis revealed that in the pretest, almost all 25(100%) had average recovery and also in the post test almost all 25(100%) had average recovery in the control group.

The second objective was to determine the effects of Sensory Stimulation Assessment Measure [SSAM] on level of consciousness among clients with Total Brain Injury (TBI) in the experimental and control group.

Findings revealed that in the pretest, the mean score of consciousness was 7.92 with S.D 1.04 whereas in the post test the mean score of consciousness was 10.72 with S.D 2.09. The calculated paired 't' value of t = 7.483 was found to be statistically significant at $p<0.001$ level. This clearly shows that the Sensory Stimulation Assessment Measure [SSAM] administered to the patients with Total Brain Injury [TBI} had significant improvement in the post test level of consciousness in the experimental group.

Hence the null hypothesis $\mathbf{NH_1}$ stated earlier that **"**There is no significant difference in the pre and post level of consciousness among clients with Total brain injury in experimental group**"** is rejected.

The findings also revealed that in the control group, in the pretest, the mean score of consciousness was 8.32 with S.D 1.18 whereas in the post test the mean score of consciousness was 8.40 with S.D 1.26. The calculated paired 't' value of t = 1.445 was not found to be statistically significant at $p<0.05$ level. This clearly shows that there was no significant difference in the level of consciousness among patients with Total Brain Injury [TBI] in the control group who had undergone normal hospital routine measures.

Hence the null hypothesis **NH_1** stated earlier that **"**There is no significant difference in the pre and post level of consciousness among clients with Total brain injury(TBI) in control group**"** is accepted.

The analysis also showed that in the pretest, the mean score of consciousness in the experimental group was 7.92 with S.D 1.03 whereas in the control group the mean score of consciousness was 8.32 with S.D 1.18. The calculated unpaired 't' value of t = 1.273 was not found to be statistically significant at $p<0.05$ level. This clearly shows that there was no significant difference in the pretest level of consciousness among patients with Total Brain Injury [TBI] between the experimental and control group.

The analysis also revealed that in the post test, the mean score of consciousness in the experimental group was 10.72 with S.D 2.09 whereas in the control group the mean score of consciousness was 8.40 with S.D 1.26. The calculated unpaired 't' value of t = 4.752 was found to be statistically significant at $p<0.001$ level. This clearly shows that there was significant difference in the post test level of consciousness among patients with Total Brain Injury [TBI] between the experimental and control group which clearly indicates that Sensory Stimulation Assessment Measure [SSAM] administered to the patients with Total Brain Injury [TBI} had significant improvement in the post test level of consciousness in the experimental group than the patients in the control group who had undergone normal hospital routine measures.

The findings of the study were found to be consistent with the study conducted by **Gerber C.S (2005)** to find out early starting of stimulation therapy in total brain injury patients. The research was randomized controlled trial. In this study, sixty adults admitted to the Department of intensive care unit were randomly selected. Both study and control groups had 30 patients each. The study group was given stimulation therapy while those in control group received no stimulation. The level of consciousness was assessed before and two weeks after giving stimulation therapy (10.45 Vs 5.9 respectively, $p<0.05$). The results showed that improvement in the level of consciousness was better in study group as compared to control group after two weeks of stimulation therapy.

The third objective was to associate the selected demographic variables with level of consciousness among the clients with Total Brain Injury(TBI) in the experimental and control group.

The analysis revealed that the demographic variables marital status and level of consciousness had shown statistically significant association with pretest level of consciousness among clients with Total Brain Injury {TBI} in the experimental group at $p<0.05$ level and $p<0.001$ level respectively and the other demographic and clinical variables had not shown statistically significant association with pretest level of consciousness among clients with Total Brain Injury [TBI] in the experimental group.

Hence the null hypothesis **NH_2** stated earlier that **"There is no significant association of the pretest level of consciousness with selected demographic variables of clients with Total brain injury (TBI) in the experimental group"** is rejected for the demographic variables marital status and level of consciousness and accepted for other demographic variables.

The analysis also showed that the demographic variables age and religion had shown statistically significant association with post test level of consciousness among clients with Total Brain Injury {TBI} in the experimental group at $p<0.05$ level and the other demographic and clinical variables had not shown statistically significant association with post test level of consciousness among clients with Total Brain Injury [TBI] in the experimental group.

Hence the null hypothesis **NH_2** stated earlier that **"There is no significant association of the post test level of consciousness with selected demographic variables of clients with Total brain injury (TBI) in the experimental group"** is rejected for the demographic variables of age and religions and accepted for other demographic variables.

The analysis further showed that the demographic variable and level of consciousness had shown statistically significant association with pretest level of consciousness among clients with Total Brain Injury {TBI} in the control group at $p<0.001$ level and the demographic variables and other clinical variables had not shown

statistically significant association with pretest level of consciousness among clients with Total Brain Injury [TBI] in the control group.

Hence the null hypothesis **NH_2** stated earlier that **"There is no significant association of the pretest level of consciousness with selected demographic variables of clients with Total brain injury(TBI) in the control group"** is rejected for the demographic variable level of consciousness and accepted for other demographic variables.

The results showed that the clinical variables causes for hospitalization and level of consciousness had shown statistically significant association with post test level of consciousness among clients with Total Brain Injury {TBI} in the control group at $p<0.05$ and $p<0.001$ level respectively and the demographic variables and other clinical variables had not shown statistically significant association with post test level of consciousness among clients with Total Brain Injury [TBI] in the control group.

Hence the null hypothesis **NH_2** stated earlier that **"There is no significant association of the post test level of consciousness with selected demographic variables of clients with Total brain injury(TBI) in the control group"** is rejected for the demographic variables causes of hospitalization and level of consciousness and accepted for other demographic variables.

CHAPTER – VI

SUMMARY, CONCLUSION, IMPLICATIONS, RECOMMMENDATIONS AND LIMITATIONS

This chapter deals with summary of the study findings, conclusion and the implications of the findings in nursing practice, administration, education and research followed by suggestions and recommendations for research in future.

SUMMARY

TBI is a leading cause of mortality , morbidity and socio economic losses in India.TBI is a significant public health problem worldwide and is predicted to surpass many diseases as major cause of death and disability by the year 2020.one of the main consequences of head injury is coma.

Center for Disease Control and prevention (CDC) referred to TBI as the Silent Epidemic.Until now, no treatment has shown its efficacy in patients with severe brain injury with the exception of the one pharmacological agent (i.e.,Amantadine).

Recovery of consciousness is therefore one of the biggest challenge facing clinicians. For years SSAM have been the most frequently applied treatment during patient neuro rehabilitation .These programs are based on the idea that an enriched environment benefits in Brain plasticity and improves recovery of injured brains.

An early and consistent administration of the correct rehabilitation programme is of crucial importance for the restoration and improvement in cerebral function as well as social integration.

The objectives of the study were

1. To assess the pre and post-test level of consciousness among clients with Total Brain Injury in the experimental and control group.
2. To determine the effects of Sensory Stimulation Assessment Measure [SSAM] on level of consciousness among clients with Total Brain Injury in the experimental and control group.

3. To associate the selected demographic variables with level of consciousness among the clients with Total Brain Injury in the experimental and control group.

The null hypotheses formulated were

NH_1: There is no significant difference in the pre and post level of consciousness among clients with Total brain injury (TBI) in experimental and control group.

NH_2: There is no significant association of the pre and post-test level of consciousness with selected demographic variables of clients with Total brain injury (TBI) in the experimental group.

Review of literature that provided a base to construct the tools and selection of research methodology. The quantitative quasi experimental design was found to be suitable for the study. The conceptual framework was based on Imogene ‘s King goal attainment theory and it provided a comprehensive guide for achieving the objectives of the study.50 samples in that 25 for experimental and 25 for control group Total Brain Injury clients were selected by purposive sampling technique.

The tool consist of 3 parts ,demographic variables, Development of intervention Sensory Stimulation Assessment Measure (SSAM), An extreme international standardized assessment scale GCS was used to assess the level of consciousness.

The content validity of the tools was obtained from the experts from the field of Neurology, Ortho pedic, Trauma care emergency department and medical surgical nursing.

The pilot study was conducted in SIMS Hospital, Vadapalani. Chennai and it was found practicable and feasible to proceed with the main study. The reliability was tested by using test retest method and the ‘r’ value was 0.91 which showed high reliability.

The pre test data for experimental group was collected using questionnaire to collect demographic variables by interview method following this pre test level of consciousness checked with the help of GCS scale. The post test was collected using the same tool after seven days and analysed. For the control group only the pre and post test

level of consciousness was checked with the help of GCS scale .The data was analysed by using descriptive and inferential statistics.

Major findings of the study

The comparison of pre test and post test level of consciousness score revealed a high statistical significance and hence the null hypothesis NH1 was rejected.

The association of mean differences of pre and post test level of consciousness in the experimental group reveals that marital status, level of consciousness showed a statistical significance at $p < 0.05$ level and no significance of other variables like sex, education, occupation, history of comorbid illness. Hence the null hypothesis NH2 was rejected.

CONCLUSION

The present study evaluated the effect of Sensory Stimulation Assessment Measure (SSAM)on level of consciousness among clients with Total Brain Injury(TBI).

The results of the study revealed that there was a significant "t" test ant difference in the level of consciousness after administration of SSAM. The investigator concluded SSAM among Total Brain Injury clients(TBI) will improve the level of consciousness ,so SSAM is an effective method to bring the level of consciousness among Total Brain Injury client(TBI). This can be practiced in all the hospitals to fasten the recovery and improve the level of consciousness.

IMPLICATIONS

The investigator observed the following implications drawn from the study which are of vital concern for nursing practice, nursing education, nursing administration and nursing research.

Nursing Practice

- The nurse has a vital role in improving the level of consciousness among clients through effective administration of SSAM an independent nursing intervention.

- The clinical nurse can plan formulating the protocol for SSAM that should insist the nurse who is taking care for neurological clients to practice in their daily routine, and educate the benefits of SSAM in both physical and psychological aspect of clients with TBI.
- The nurse should organize awareness programme for family and community regarding effective use of SSAM on various conditions like hepatic coma encephalopathy.
- Community nurse can pan SSAM sessions for different patients as rehabilitation aspects.
- In hospital nurse should act as a facilitator for TBI clients receiving SSAM to improve the level of consciousness and promote early recovery and the acceptance of situation so as to gain their cooperation and to perform the procedure in an effective and easy way.

Nursing Administration

- Nursing administrator can formulate the information booklet, video show, can be used for the client attenders/family to teach them about effect of SSAM on level of consciousness . Administrator have to ensure that the programme is implemented effectively in the hospital and in the home.
- Nurse Administrators should take an initiation in organizing continuing nursing education and conferences, workshop on newer trends and development in SSAM on level of consciousness among clients with TBI.
- Nurse Administrators should plan teaching strategies to educate the client's family and nursing staff working in Neuro ICU and Neuro Wards.
- The Nurse Administrator can allot separate budget for in-service education to all nurses, and also she can plan incentives for nurses who are involving in complementary therapy and in patient education.
- Nurse Administrator at various level of Health Care Delivery System should focus their attention and make public awareness about the SSAM as an effective tool.

Nursing Education

- The nursing curriculum for under graduate and post graduate student should also focus on SSAM. The nurse educator must enable the student nurses to gain skill required to educate the SSAM and management of clients with TBI .

- The educational institution must provide opportunities for nursing students to get exposed to sub speciality units such as rehabilitation organized by the hospital and give the training in that field. The student should know about the effect of SSAM.

Nursing Research

- The nurse researcher should work on the quality life of clients with TBI.
- The mechanism of SSAM is one of the complex process which indicate furthermore research on understanding brain functions &role of SSAM.
- Nurse researcher must apply the concept of evidence based practice.

RECOMMENDATIONS

- A similar study can be conducted on large scale for better generalization
- Quality of life can be studied using such type of study**.**
- A study can be conducted in clinical setting regarding knowledge of practicing SSAM on level of consciousness among staff nurses.
- A true experimental study can be conducted.
- A similar study can be done with long-term intervention of SSAM.
- A comparative study can be done with other Intervention &Sensory Stimulation to know the effectiveness of SSAM.
- A similar study can be conducted on chronic conditions like coma patients.
- A similar study can be done with multiple time series design.

LIMITATIONS

The limitations of the present study were:

1. Study was limited to 50 patients only.
2. Intervention was limited to twice a day 30 minutes for per session for two times a day into 7 days.
3. 3.Findings of the study has limitation in generalizations due to low sample size that is 50 (25 in each group.

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Indira College of Nursing

(Approved by INC & Tamilnadu Nurses & Midwives Council) (Affiliated to The Tamilnadu Dr. MGR Medical University)

RESEARCH ADVISORY COMMITTEE CERTIFICATE

Valid from : April 2016
Valid to : July 2017

Name of the principle investigator: **Ms. Mathumathi.S**, M.Sc. (N) Student (Medical Surgical Nursing - Subspecialty - (Critical Care Nursing)

The Ethical committee meeting was held on **29.04.16** had received the project title, **"A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with Total Brain Injury (TBI) at selected hospital, Chennai".**

The Proposal was found to be acceptable on ethical grounds. The Principal Investigator has the responsibility and accountability for any other administrative / regulatory approvals that may pertain to this research project and for ensuring that the authorised research is conceded out according to the condition outlined in the original protocol or consent process and documents of the study.

This certificate of approval is valid for the time period provided. There should be no change in the methodology protocol or consent process and documents of the study.

Any significant change should be reported to Director Research Committee for consideration in advance towards its implementation.

Signature of Research Director :

PRINCIPAL
INDIRA COLLEGE OF NURSING
PANDUR - 631 203
THIRUVALLUR.

Signature of the Researcher : S. Mathumathi

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Indira College of Nursing

(Approved by INC & Tamilnadu Nurses & Midwives Council) (Affiliated to The Tamilnadu Dr. MGR Medical University)

INSTITUTIONAL ETHICAL COMMITTEE APPROVAL CERTIFICARE

Valid from : August 2016
Valid to : August 2017

Name of the Principle Investigator: Mrs. Mathumathi. S, Student (Medical Surgical Nursing- Speciality)

The Ethical Committee meeting held on 17.06.2016 had reviewed the project title **"A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on Level of Consciousness among clients with Total Brian Injury (TBI) at Selected Hospital, Chennai".**

The proposal was found to be acceptable on ethical grounds. The Principle Investigator has the responsibility and accountability for any other administrative / regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is concede out according to the conditions outlined in the original protocol submitted for ethics review.

This certificate of approval is valid for the time period provided that is one year time there is no change in the methodology protocol or consent process and documents of the study.

Any significant change should be reported to the RAC & IEC chairperson and members for Research consideration in advance for its implementation.

Signature of Research a Chairperson :

Signature of Researcher :

Indira EDUCATION

Indira College of Nursing

(Approved by INC & Tamilnadu Nurses & Midwives Council) (Affiliated to The Tamilnadu Dr. MGR Medical University)

07.06.17

To

The Director,
Directorate of Medical Service,
SIMS Hospital,
Vadapalani, Chennai.

Respected Sir,

This is to certify that **Ms. Mathumathi. S,** is studying M.Sc Nursing II year at Indira College of Nursing, Pandur Thiruvallur, as part of her M.Sc Nursing Clinical Speciality – Medical Surgical Nursing – (Sub Speciality - Critical Care Nursing), curriculum requirement she has to submit a Nursing Research Dissertation to the The Tamilnadu Dr. MGR Medical University, Anna Salai, Guindy, Chennai.

The college RAC & IEC has approved the statement of the problem as **"A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on Level of Consciousness among clients with Total Brain Injury at Selected Hospital, Chennai".**

With this regard, she needs to get neurological clients who are hospitalised in SIMS Hospital Neuro wards/ICU during June to July 2017. Kindly permit her to do the data collection at the SIMS Hospital. She will abide by the rules and regulations of the hospital. We assure that her data collection will not harm the routines, protocols of the hospital and patients wellbeing and safety by any means. She will make sure that a strict confidentiality will be maintained throughout the study period.

Kindly permit her to do the study at your esteemed hospital.

Please do the needful in favour.

Thanking you

Your's faithfully,

PRINCIPAL
INDIRA COLLEGE OF NURSING
PANDUR - 631 203
THIRUVALLUR.

SIMS
SRM INSTITUTES FOR MEDICAL SCIENCE
VADAPALANI

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9th June 2017

To

The Principal,
Indira College Of Nursing,
Pandur-631 203,
Thiruvallur District.

Dear Sir/ Madam,

We are happy to accept **Mrs. Mathumati.S**, student in **M.Sc.,Nursing** II nd year in our institution to conduct an **" A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with ~~Total~~ Brain Injury (~~TBI~~)".**

She is advised not to take photographs nor publish the study material conducted on our patients without our knowledge and concurrence.

The privacy of our patients shall be protected at all costs and there shall not be any extra expenditure to our patients or our institution.

She will be requested to follow standard precautions against Hospital acquired infection.

Thanking you,

Yours sincerely,

Dr.Suresh Bapu K.R
Director & Senior Consultant Neurosurgeon
SRM Institutes for Medical Science
Vadapalani, Chennai

Dr. K.R. SURESH BAPU, M.S., M.Ch (Neuro)
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Dr. Vijayakumar Chockkan
MBBS, M.Sc, PhD. (Neurosciences)
Director of Medical Services
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Date : 09.06.2017

To,

The principal,

Indira college of Nursing,

Pandur – 631 203,

Thiruvallur District

Dear Sir/Madam,

We are happy to accept **Mrs. Mathumathi.S,** student in **M.Sc., Nursing** 2Year in our institution to conduct an "A Study to evaluate the effect of **Sensory Stimulation Assessment Measure (SSAM)** on level of consciousness among clients with **Total Brain Injury (TBI)**".

She is advised not to take photographs nor publish the study material conducted on our patients without our knowledge and concurrence.

The privacy of our patients shall be protected at all costs and there shall not be any extra expenditure to our patients or our institution.

With warm regards,

For SRM INSTITUTES FOR MEDICAL SCIENCE

Dr.Vijayakumar Chockkan

Director of Medical Services

Dr. VIJAYAKUMAR CHOCKKAN
MBBS., M.Sc., Ph.D., Neurosciences (Canada)
Director of Medical Services
SRM Institutes for Medical Science
Vadapalani, Chennai - 600 026.

LETTER REQUESTING FOR OPINION AND SUGGESTION OF EXPERTS FOR CONTENT VALIDITY OF THE RESEARCH TOOLS

From

Mrs. Mathumathi.S
M.Sc Nursing IInd Year
Indira College of Nursing
Pandur
Thiruvallur.

To

THE DEAN
SRM UNIVERSITY
COLLEGE OF NURSING
POTHERI

To Ms Akila

27/4/17

Through the Principal

Respected Sir/Madam

Sub: Requisition for expert opinion suggestion for content validity of thetool for nursing researchdissertation

---

I, **Mrs. Mathumathi.S**, II year M.Sc Nursing Student of Indira College of Nursing, Pandur, Thiruvallur, under TamilnaduDr. MGR Medical University, Guindy , Chennai.

As a part of the curriculum requirement in Nursing Research dissertation I have selected the title mentioned below:

Statement: " A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with Total Brain Injury (TBI) at selected hospital, Chennai".

Herewith I enclosed the tool which I have prepared for my dissertation for your kind perusal, Kindly give your valuable suggestion, for the refinement and validity of the tool. Kindly do the needful and favour.

Thanking you,

Place: POTHERI

Date : 27-4-2017

S. Mathumathi

Yours faithfully

(S.Mathumathi)

Enclosures:

1. Certificate of content validity
2. Statement of the problem and objectives of the study
3. Tool for the data collection
4. Self-addressed envelope

LIST OF EXPERTS FOR CONTENT VALIDITY

MEDICAL EXPERTS:

1. **Dr. Vijay Sankaran, M.Ch (Neuro)**
   Senior Consultant Neurosurgeon,
   Institute of Neurosciences,
   SRM Institutes for Medical Sciences,
   Chennai

2. **Dr.P.S. Ashok kumar,M.S (Ortho)**
   Consultant Orthpaedic Surgeon,
   SRM Institutes for Medical Sciences,
   Chennai.

3. **Dr.Jayaraman.S**
   Senior Consultant and H.O.D
   Emergency and Trauma Unit
   SRM Institutes for Medical Sciences,
   Chennai.

NURSING EXPERTS:

4. **Prof.Mrs.Sumathi, M.Sc(N)**
   H.O.D Medical Surgical Nursing
   Omayalachi College of Nursing, Puzhl,
   Chennai.

5. **Prof.Mrs.Akiladevi, M.Sc(N)**
   H.O.D Medical Surgical Nursing
   SRM College of Nursing,
   Chennai.

6. **Mrs Vidya B.Sc. (N)**
   Neuro ICU Nursing Officer,
   SIMS Hospital,
   Chennai.

7. **Mrs.Thangam.S B.Sc (N), M.B.A (Hosp. Admin)**
   Charge Nurse,
   SIMS Hospital,
   Chennai.

8. **Mrs.Radha.N**
   Emergency and Trauma care Technologist,
   SIMS Hospital,
   Chennai.

BIO STATISTICIAN

9. **Mr.Porchelvan,M.Sc.(Stat-Loyola).,**
   M.B.A., PG.DCA., Ph.D (ICMR)
   Professor
   Saveetha University.
   Chennai**.**

CERTIFICATE OF VALIDATION

This is to certify that the tool developed by Mrs. Mathumathi.S, II Year M.Sc Nursing Student, of Indira College of Nursing –Pandur, Thiruvallur .(Affliated to the Tamilnadu Dr.MGR Medical University,Chennai.) is validated and can proceed with this tool for data collection during the main study entitled **" A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with Total Brain Injury (TBI) at selected hospital, Chennai".**

Place:

Date:

SRM INSTITUTES FOR MEDICAL SCIENCE
No.1, J.N. Salai, 100 Feet Road, Vadapalani, Chennai-26

Signature with Seal

DR.VIJAY.S
SR.CONSULTANT NEURO SURGEON
SIMS HOSPITAL VADAPALNI,
CHENNAI

Dr. VIJAY SANKARAN, M.Ch (Neuro)
Senior Consultant Neurosurgeon
Institute of Neurosciences
Reg. No. 59051
SRM Institutes for Medical Science
Vadapalani, Chennai - 600 026

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Place: Chennai

Date:

Signature with Seal

Dr.P.S. ASHOK KUMAR,M.S(Ortho)
Consultant Orthopaedic Surgeon
Reg. No. 71547
SRM Institutes for Medical Science
Vadapalani, Chennai - 600 026.

CERTIFICATE OF VALIDATION

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Place:

Date: 0

SRM INSTITUTES FOR MEDICAL SCIENCE
No.1,
J.N. Salai,
100 Feet Road,
Vadapalani,
Chennai-26

S. Jayaraman

Signature with Seal

Dr. S. JAYARAMAN
67773

DR.JAYARAMAN.S
SR.CONSULTANT & HOD
EMERGENCY & TRAUMA UNIT
SIMS HOSPITAL VADAPALNI,
CHENNAI

CERTIFICATE OF VALIDATION

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Place: PUZHAL, CHENNAI

Date:

Signature with Seal

Prof. & Head of the Department,
MEDICAL SURGICAL NURSING

OMAYAL ACHI COLLEGE OF NURSING
No. 45, Ambattur Road,
PUZHAL,
CHENNAI-600 066

CERTIFICATE OF VALIDATION

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Place: Kattankulathur

Date: 27/04/2017

A. Asha devi 27/04/17

Signature with Seal

Professor & HOD
Dept. of Medical Surgical Nursing
SRM College of Nursing
SRM UNIVERSITY
Kattankulathur - 603 203,
Kancheepuram Dist., Tamil Nadu, India

CERTIFICATE OF VALIDATION

This is to certify that the tool developed by Mrs. Mathumathi.S, II Year M.Sc Nursing Student, of Indira College of Nursing –Pandur, Thiruvallur .(Affliated to the Tamilnadu Dr.MGR Medical University,Chennai.) is validated and can proceed with this tool for data collection during the main study entitled " **A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with Total Brain Injury (TBI) at selected hospital, Chennai**".

Place:

Date:

SRM INSTITUTES FOR MEDICAL SCIENCE
No.1, J.N. Salai, 100 Feet Road, Vadapalani, Chennai-26

Signature with Seal

MRS.VIDHYA
NEURO ICU NURSING OFFICER
SIMS HOSPITAL VADAPALNI,
CHENNAI

CERTIFICATE OF VALIDATION

This is to certify that the tool developed by Mrs. Mathumathi.S, II Year M.Sc Nursing Student, of Indira College of Nursing –Pandur, Thiruvallur .(Affliated to the Tamilnadu Dr.MGR Medical University,Chennai.) is validated and can proceed with this tool for data collection during the main study entitled **" A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with Total Brain Injury (TBI) at selected hospital, Chennai".**

Place:

Date:

SRM INSTITUTES FOR MEDICAL SCIENCE
No.1,
J.N. Salai,
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Vadapalani,
Chennai-26

Signature with Seal

MRS.THANGAM.S
CHARGE NURSE
EMERGENCY & TRAUMA UNIT
SIMS HOSPITAL VADAPALNI,
CHENNAI

ETCT Tech

CERTIFICATE OF VALIDATION

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Place:

Date:

SRM INSTITUTES FOR MEDICAL SCIENCE
No.1,
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Chennai-26

Smt. N. RADHA
13.8.1

Signature with Seal

MRS.RADHA.N
EMERGENCY & TRAUMA CARE TECHNOLOGIST
SIMS HOSPITAL VADAPALNI,
CHENNAI

CERTIFICATE OF VALIDATION

This is to certify that the tool developed by Mrs. Mathumathi.S, II Year M.Sc, Nursing Student, of Indira College of Nursing –Pandur,Thiruvallur .(Affliated to the TamilnaduDr.M .G .R Medical University,Chennai.) is validated and can proceed with this tool for data collection during the main study entitled **" A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with Total Brain Injury (TBI) at selected hospital, Chennai".**

Place:

Date:

Signature with Seal

Dr. S. Porchelvan,
M.Sc., MBA., PG.DCA., Ph.D.,
Professor of Biostatistics
Saveetha Medical College,
Saveetha University,
Thandalam, Chennai - 602 105.

CERTIFICATE OF ENGLISH EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed by Mrs. Mathumathi.S, II Year M.Sc, Nursing Student, of Indira College of Nursing –Pandur, Thiruvallur . (Affliated to the Tamilnadu Dr.M .G .R Medical University, Chennai.) is validated and can proceed with this tool for data collection during the main study entitled **" A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with Total Brain Injury (TBI) at selected hospital, Chennai".**

Place: GURUVOYAL

Date: 25.07.2017

25/7/17.

Signature with Seal

P. DESINGH
M.A.(Tam)., M.A. (Eng)..
M.Sc.,(C&P), M.Phil, M.Ed.,
PGT In English,
Govt. Hr. Sec. School,
Guruvoyal, Thiruvallur Dist.

CERTIFICATE OF TAMIL EDITING

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the tool developed by Mrs. Mathumathi.S, II Year M.Sc, Nursing Student, of Indira College of Nursing –Pandur, Thiruvallur . (Affliated to the Tamilnadu Dr.M .G .R Medical University, Chennai.) is validated and can proceed with this tool for data collection during the main study entitled **" A study to evaluate the effect of Sensory Stimulation Assessment Measure (SSAM) on level of consciousness among clients with Total Brain Injury (TBI) at selected hospital, Chennai".**

Place: GURUVOYAL

Date: 25/07/2017

Signature with Seal 25/7/17

நா.பிரபாவதி
எம்.ஏ., எம்.பில்.,பி.எட்.,
முதுகலைத் தமிழாசிரியை,
அரசு மேல்நிலைப்பள்ளி,
குருவாயல்,திருவள்ளூர் மாவட்டம்

INFORMED CONSENT FORM

The client is unable to consent because_____and I Mr/Ms/Mrs_____(name/relationship to the client) therefore consent for the patient and understood that my client is being asked Participate in a research study conducted by S.Mathumathi, M.Sc Nursing II year student from Indira College of Nursing, Pandur, Thiruvallur. The study entitled "**A Study to evaluate the effect of Sensory Stimulation Assessment Measure(SSAM) on level of consciousness among clients with Total Brain Injury (TBI) at selected hospital, Chennai.**

The scope of the study has been explained to me in my own language clearly. I realize that myrelative participation is entirely voluntary and I maywithdraw my relative at any time during the study.

I permit the researcher to take photos as need be and I know that the photos used only for research purpose and will be kept confidential.

I understood that all study data will be kept confidential and will not be utilized for any other purpose. If any doubts I have I c and I know that I can contacttheresearcher the mobilenumber 8015413105between 5pm – 7pm on all days through the week.

I have read and understood this consent form clearly,all of my questions have been answered and cleared by the researcher.

I agree and allow my relative to be a participantin this study.

Signature of the caretaker: **Date:**

Signature of the Investigator: **Date:**

STRUCTURED QUESTIONNAIRE SCHEDULE

Effect of sensory Stimulation Assessment Measure (SSAM) on level of Consciousness among clients with Total Brain Injury (TBI)

A. SELECTED DEMOGRAPHIC VARIABLES

Please tick the appropriate option in the box given below

1. Age in Years
   - A) 21-30 years { }
   - B) 31-40 years { }
   - C) 41-50 years { }
   - D) 51years and above { }

2. Sex
   - A) Male { }
   - B) Female { }

3. Marital Status
   - A) Single { }
   - B) Married { }

4. Religion
   - A) Hindu { }
   - B) Christian { }
   - C) Muslim { }
   - D) Others { }

5. Education
   - A) Non- formal Education { }
   - B) Primary Education { }
   - C) Secondary Education { }
   - D) Graduate { }
   - E) Post Graduate { }

6. Occupation
   A) Unskilled { }
   B) Semiskilled { }
   C) Nonprofessional { }
   D) Professional { }

7. Monthly family income
   A) Rs.6000 { }
   B) Rs. 6001 – 16000 { }
   C) Rs. 16001 – 30000 { }
   D) Rs. 30,001 above { }

8. History of Co-morbid illness
   A) Cardio Vascular disease { }

   B) Diabetes Mellitus { }
   C) Respiratory Disease { }
   D) Others { }

9. Current Treatment for co-morbid illness
   A) Yes, if yes specify_____ { }
   B) No { }

10. Accompanying injuries
   A) No injuries { }
   B) Limb Fracture { }
   C) Rib Fracture { }

11. Cause for hospitalization
   A) Motor Accident { }
   B) Car Accident { }
   C) Falling { }
   D) Others { }

12. Types of Brain Injury

A) Subdural Haemorrhage { }

B) Intra Cranial Haemorrhage { }

C) Diffuse Axonal Injury { }

D) Mixed { }

13. Duration of hospital stay in ICU and ward

A) 1-10 days { }

B) 11-20 days { }

C) > 31 days { }

14. Vital signs

A) Stable { }

B) Unstable { }

15. Intra Cranial Pressure (ICP) variation

A) 7-9 mmHg { }

B) 10-12 mmHg { }

C) 13-15 mmHg { }

16. Level of consciousness

A) GCS score 7 { }

B) GCS score 8 { }

C) GCS score 9 { }

D) GCS score 10 { }

தகவல் சேகரிப்பு கருவி

பகுதி-அ: தனி நபர் விவரம்
எண்:
சரியான பதிலை குறியிடவும்:

1. வயது

அ) 21 - 30

ஆ) 31 - 40

இ) 41 - 50

ஈ) 50க்கும் மேல்

2. பாலினம்

அ) ஆண்

ஆ) பெண்

3. திருமண விபரம்

அ) திருமணமாகாதவர்

ஆ) திருமணமானவர்

4. மதம்

அ) இந்து

ஆ) கிறிஸ்துவர்

இ) இஸ்லாமியர்

ஈ) மற்ற இனத்தவர்

5. கல்வித் தகுதி

அ) சாதாரண கல்வி இல்லை

ஆ) முதன்மை நிலை

இ) இரண்டாம் நில

ஈ) பட்டதாரி

உ) இளங்கலை

6. தொழில்

அ) திறமையற்ற தொழிலாளர்

ஆ) அரை திறமையானவர்

இ) திறமையான தொழிலாளர்

ஈ) அரை மேம்பாடு தொழிலாளர்

7. மாத வருமானம்

அ) ரூ.6,000/-

ஆ) ரூ.6,001 – 16,000

இ) ரூ.16,001 – 30,000

ஈ) ரூ.30,000-க்கும் மேல்

8. இணை நோய்

அ) இருதய நோய்

ஆ) நீரிழிவு நோய்

இ) சுவாச நோய்

ஈ) மற்றவை

9. துணை நோய்க்கான தற்போதைய சிகிச்சை

அ) ஆம்

ஆ) இல்லை

10. அதனுடன் காயங்கள்

அ) எந்த காயமும் இல்லை

ஆ) எலும்பு முறிவு

இ) இடுப்பு எலும்பு முறிவு

11. மருத்துவமனை வருவதற்கான காரணங்கள்

அ) மோட்டர் விபத்து

ஆ) கார் விபத்து

இ) கீழே விழுதல்

ஈ) மற்றவை

12. மூளை காயத்தின் வகைகள்

அ) சப்டூயூரல் ஹேமரேஜ்

ஆ) இன்ட்ரா கிரேனியல் ஹேமரேஜ்

இ) டிவ்யூஸ் ஆக்ஸோனல் ஹேமரேஜ்

ஈ) கலந்தவை

13. மருத்துவமனையில் இருந்த நாள்களின் கால அவகாசம்

அ) 6 – 10 நாட்கள்

ஆ) 11 – 20 நாட்கள்

இ) > 31 நாட்கள்

14. முக்கிய அடையாளம்

அ) நிலையான

ஆ) நிலையற்ற

15. நிலையான ஜ.ஸி.பி.

அ) 7 – 9

ஆ) 10 – 12

இ) 13 – 15

16. உணர்வு நிலை

அ) ஜி.ஸி.எஸ் 7

ஆ) ஜி.ஸி.எஸ் 8

இ) ஜி.ஸி.எஸ் 9

ஈ) ஜி.ஸி.எஸ் 10

பகுதி - II

உணர்திறன் தூண்டுதல் மதிப்பீடு நடவடிக்கை

அ. **வரையறை :**

உணர்திறன் தூண்டுதல் மதிப்பீடு நடவடிக்கையாக மொத்த மூளை காயம் வாடிக்கையாளருக்கு நினைவின் நிலைமையை மேம்படுத்த முழு கருவியாகும்.

ஆ. **நோக்கம் :**

1. குறிக்கோள் நடவடிக்கைகளை நோக்கிய பதில்களின் அளவு மற்றும் தரத்தை மேம்படுத்துல்.

2. சூழ்நிலைக்கு ஒரு நோயாளிக்கு பதிலளிப்பதற்காக நோயாளிக்கு வாய்ப்புகளை வழங்குதல்.

3. சுற்றுச்சூழல் உணர்வு இழப்பு மற்றும் மத்திய நரம்பு மண்டல செயல்பாடு வளர்ச்சி தடுக்க.

4. நோயாளிகள் அக்கறையை அடிக்கடி கண்காணிக்க அனுமதிக்க.

5. உள்வரும் தூண்டுதல்களை பாதுகாக்க தேவையான அளவுக்கு விழிப்புணர்வு மற்றும் கவனத்தை அதிகரிக்க.

இ. **அறிகுறி :**

1. கிளாஸ்கோ கோமா அளவிலான ஸ்கோர் 7 – 10 .
2. மருத்துவ ரீதியாக நிலையான வாடிக்கையாளர்.
3. சாதாரண ICP வாடிகையாளர்கள்.

ஈ. **பரிந்துரைக்கப்படாதவர்கள் :**

1. மருத்துவ நிலையற்ற வாடிக்கையாளர்.
2. மூச்சு பெருங்கழலுள் செருகல் உள்ள வாடிக்கையாளர்.
3. மண்டை ஓட்டுக்குள்ளான அழுத்தம் அதிகரித்து உள்ள வாடிக்கையாளர்.
4. வென்ட்ரிடு லோஸ்டமி குழாய் உள்ள வாடிக்கையாளர்.

தேவையான பொருட்கள் :

1. பேனா ஜோதி
2. வண்ணத் தொகுதி
3. பளபளப்பான நிற பலகை
4. ஒலி பதிவு பெட்டி
5. பருத்தி கம்பளி
6. களைந்துவிடும் துணி
7. ஒரு கிண்ணத்தில் வெதுவெதுப்பான தண்ணீர்
8. குளிர்ந்த நீர்
9. மேக்கின் டோஷ்
10. களைந்துவிடும் சிறுநீரகதட்டு
11. களைந்துவிடும் கையுறை

செய்முறை : முதலில் செய்ய வேண்டியவை

1. நோயாளியின் உடல்நிலை மதிப்பு மதிப்பீடு செய்து GCSஐ சரிபார்க்கவும்.
2. வாடிக்கையாளர் செயல்முறை விளக்க மற்றும் சரியான ஒப்புதல் பெற வேண்டும்.
3. படுக்கறைகளில் சேகரித்து அசெம்பிள் செய்யுங்கள்
4. தனியுரிமையை வழங்கவும், சக்கர நாற்காலியில் நேர்மையாக உள்ள நோயாளியை படுக்கையில் வைக்கவும்.
5. கைகள் மற்றும் டான் கையுறைகள் கழுவி

வழிமுறை : அ. காட்சி தூண்டுதல்

பேனா ஜோதி:

- வாடிக்கையாளர் தங்கள் தலையை நகர்த்த கூடாது அறிவுறுத்த
- பிடித்து மற்றும் பேனா ஜோதி 12 முதல் 15 அங்குலங்கள் மையமாக வைத்து கவனம் செலுத்துங்கள் மற்றும் மெதுவாக பார்வையிடும் பார்வையிலிருந்து பார்வையிடும் பார்வையின் மத்திய அம்சங்களுக்கு
- ஒவ்வொரு கண் ஒரு கண் பிரகாசமாக வலது கண் மற்றும் பின்னர் 10 வினாடிகளுக்கு 3 முறை விநாடி 2 விநாடிகள் இடைவெளி வழங்கப்படும் தூண்டுதல் பதிலளித்தார்

வழிமுறை : ஆ பிரகாசமான வண்ண தொகுதிகள்

- பிங்க, சிவப்பு மற்றும் நீலப்பகுதியிலிருந்து வாடிக்கையாளர்களின் மையக் கூறுகளுக்கு வரிசையில் வண்ணத் தொகுதிகள் (12cm x 12cm அளவு)
- ஒவ்வொரு கணுக்கும் தனித்தனியாக வலது கண் மற்றும் பின் பண்ணி 10 விநாடிகளுக்கு 3 முறை நிறங்கள் 2 வினாடி இடைவெளியுடன் நிற்கும்.

வழிமுறை : இ பளபளப்பான நிறமுள்ள தொகுதிகள்

- வாடிக்கையாளர்களின் கண்ணின் மையப்பகுதியில் சுற்றுப் புறத்திலிருந்து மஞ்சள், வெள்ளி மற்றும் பச்சை வண்ண நகர்வுகளின் வரிசையுடன் (15cm x 15cm) ஒளிரும் வண்ணம் பலகை அளவைக் காட்டவும்.
- ஒவ்வொரு கண் தனியாக வலது கண் என்று பிரகாசிக்கும் குழு காட்ட பின்னர் வழங்கப்படும் தூண்டுதல் பதிலளிக்க 2 விநாடிகள் இடைவெளி 10 விநாடிகள் விட்டு

வழிமுறை : கேட்கும் தூண்டுதல்

5 நிமிடங்களின் மொத்த காலப்பகுதியுடன் 3 உருப்படிகள் உள்ளன.

பெயரை அழைத்தல்:

- குடும்பத்தை மற்றவர்கள் எப்படி அழைத்தார்கள் என்பதை அடையாளம் காண குடும்பத்திற்கு விசாரித்தார்.
- 2 விநாடி 3 முறை இடைவெளியுடன் 10 விநாடிகளுக்கு காதுப் பாட்டைப் பயன்படுத்தி வாடிக்கையாளருக்குப் பெயரிடப்பட்ட குரல்

வழிமுறை : மத பாட்டுகள்

- மதத் திருவிழாக்கள் வாடிக்கையாளர்களின் மதத்தின் அடிப்படையில் தேர்ந்தெடுக்கப்பட்டன.
- 2 வினாடிகள் இடைவெளி கொண்ட 10 விநாடிகளுக்கு காதுப்பையைப் பயன்படுத்தி வாடிக்கையாளர்களின் மதத்தை அடிப்படையாகக் கொண்டிருக்கும் பாணியில் பதிவு செய்யப்பட்ட பாட்டுகள் விளையாடப்படுகிறன்றன.

வழிமுறை : ஒருபடி சொற்பொருள் கட்டளை

- உறுதியான குரலில் உறுதியான தொனியில் வாய்மொழி கட்டளையை வழங்கவும்
- வாடிக்கையாளர்களை கையில் வைத்து வாடிக்கையாளரை ஆராய்ச்சியாளரைப் பார்க்க ஊக்குவிக்கவும்

வழிமுறை : தொட்டு உணரக்கூடிய தூண்டுதல்

5 நிமிடங்களின் மொத்த காலப்பகுதியில் வழங்கப்பட்டது

ஸ்டெர்னத்தை தேய்த்தல்

- ஒரு clenched கைகளை கழுவுதன் மூலம் கையை உறிஞ்சி, உலர்ந்த பின் கையுறைகளை எடுத்துக்கொள்வோம்.
- கை முழங்கால்களை பயன்படுத்தி வாடிக்கையாளர்கள் sternum தேய்க்க மற்றும் ஸ்டெர்னெம் இணைந்து அழுத்தம் விண்ணப்பிக்க

- 2 விநாடி இடைவெளி கொண்ட இந்த தூண்டுகை 10 வினாடிகளுக்கு 3 முறை வழங்கவும்.

வழிமுறை : பருத்தி கம்பளி

1. பருத்த கம்பளி துணியுடன் ஸ்பனோதாளாமிக் திட்டு தொடவும்
2. முன்கை மற்றும் கையை மேலே ஏறிக் கொண்டே தொடங்குங்கள்
3. ஒவ்வொரு கைக்கும் 05 வினாடிக்கு வலது மற்றும் இடது புறம் உள்ள மாற்றங்களுடன் தொடங்கும் இந்த தூண்டுதல்களை வழங்கவும் இது 2 வினாடி இடைவெளிகளுடன் 3 முறை வழங்கப்பட வேண்டும்.

வழிமுறை : சூடான மற்றும் குளிர்ந்த கழுவும் துணி

1. வாடிக்கையாளர்கள் அல்லாத காயமடைந்த பகுதியை தேர்ந்தெடுக்கவும்.
2. நோயாளியின் கீழ் மக்கிண்டோஷ் வைக்கவும்
3. வெப்பநிலையில் சூடான நீரில் செலவழிப்பு கழுவும் ஆடைகளை ஈரப்படுத்தவும் நன்கு கசக்கி விடவும்.
4. சூடான வளைவை கையில் தொடங்கி முழங்கையையும் கைகளையும் மேலே ஏறச் செய்
5. குளிர்ந்த நீரில் செலவழிப்பு கழுவும் துணியால் நனைக்கப்பட்டு நன்றாக கசக்கி கழுவும் துணியால் கையைத் தொடும் முழங்கை மற்றும் கை.
6. ஒவ்வொரு கைக்கும் 05 விநாடிகளுக்கு வலது மற்றும் இடது புறம் உள்ள மாற்றங்களுடன் தொடங்கும் இந்த தூண்டுதல்களை வழங்கவும் இது 2 வினாடி இடைவெளிகளுடன் 3 முறை மீண்டும் மீண்டும் செய்யப்பட வேண்டும்.
7. சிறுநீரகம் தட்டில் உள்ள சூடான மற்றும் ஈரமான துணிகளை அப்புறப்படுத்துங்கள்

<u>செய்முறைக்கு பின் செய்ய வேண்டியவை:-</u>

- நோயாளிக்கு உவந்த நிலையில் வைக்கவும்
- முக்கிய அறிகுறிகளை சரிபார்த்து ICPஐ கண்காணிக்கவும்.
- உபகரணங்கள் பதிலாக

- எந்த அசௌகரியத்திற்கும் வாடிக்கையாளரைக் கவனிக்கவும்
- செயல்முறைக்கு பிறகு வாடிக்கையாளரின் செயல்முறை மற்றும் பதிலை ஆவணப்படுத்தவும்.

THE SET OF SENSORY STIMULATION ASSESSMENT MEASURE(SSAM)

A. DEFINITION:

Sensory Stimulation Assessment Measure (SSAM) is the tool used for Total Brain Injury (TBI) client to improve the level of consciousness.

B. PURPOSE:

1. To improve the quantity and quality of responses toward purposeful activity
2. To provide opportunities for the patient to respond to the environment in an adoptive way.
3. To prevent environmental sensory deprivation and the development of central nervous system function.
4. To allow for frequent monitoring of patients responsiveness.
5. To increase arousal and attention to the level of necessary to preserve incoming stimuli.

C. INDICATION:

1.Glasgow coma scale score of7-10

2.Medically stable client

3.Normal ICP clients

D. CONTRA INDICATIONS:

1.Medically unstable client

2.Client on endotracheal intubation

3.Increased ICP clients

4.Clients with ventriculostomy tubing

E. ARTICLES NEEDED:

1.Pen torch

2.Coloured block –Silver.Red, and Flurescent

3.Shinycoloured card board -Yellow, Green and Pink

4.Tape recorder

5.Cotton wool

6.Disposable wash clothes

7.Bowl with warm water

8.coldwater

9.Mackintosh

10.Disposable kidney tray

11.Disposable gloves

PROCEDURE:

1. Assess the patient's health status and check the GCS
2. Explain the procedure to the client and obtain valid consent
3. Collect and assemble equipment at the bed side
4. Provide privacy and position the patient in upright in wheel chair / in the bed.
5. Wash hands and wear gloves.

I.VISUAL STIMULATION (5 MINUTES)

STEP1

(i) Pen torch:

a. Instruct the client not to move their head

b. Holdand focus the pen torch 12 to 15 inches from the client and slowly move forward to the clients eye from periphery to central aspects of the vision

c. Shine a light into each eye separately to right eye and then left eye for 10 seconds 3 times with a break of 2 seconds was given assess the response to the stimuli provided.

STEP 2

(ii) Bright coloured blocks:

a. Hold and show the coloured blocks (15cmx15cm size) in the order of silver,red and flurescent from periphery to central aspects of the clients eye.

b. Show the coloured blocks into each eye separately to right eye and then left eye for 10 seconds 3 times, with a break of 2 seconds was given to assess the response to the stimuli provided.

STEP 3

(iii) Shiny coloured board:

a. Hold and show the shinning colour board size of(15cm×15cm)with order of yellow,green and pinkcoloured move from the periphery to central aspect of the clients eye.

c. Show the shinning board into each eye separately right eye and then left eye for 10 seconds with a break of 2 seconds to was given to assess the response to the stimuli provided.

II.**AUDITORY STIMULATION:**

It consists of 3 items provided with the total period of 5 minutes.

STEP 4

(i) Calling by his/her name:

a. Enquired to the family to identify how the client is called by others

b. Recorded voice of clients name played to the client for 10 seconds with a break of 2 seconds was given to assess the response to the stimuli provided.

STEP 5

(ii) Religious chants:

a. Religious chants were selected based on the clients religion

c. Recorded chants are played to the client based on the clients religion for 10 seconds with a break of 2 secondswas given to assess the response to the stimuli provided.

STEP 6

(iii) One step verbal command:

a. Provide the verbal command in a normal tone with firm voice.

b. Hold the clients hand and encourage the client to look at the researcher.

III.TACTILE STIMULATION:

Provided with the total periods of 5 minutes

STEP 7

(i) Rubbing the sternum:

a. Warm our hands by washing hands in warm water, dry and then wear gloves
b. Rub the clients sternum by using the knuckles of a clenched fist and apply pressure along the sternum
d. Provided this stimuli for 10 seconds 3 times with 2 seconds breakwas given to assess the response to the stimuli provided.

STEP 8

(ii) Wisp of cotton wool:

a. Touch the spinothalamic tract with the wisp of cotton wool
b. Begin at the hand and ascending up the forearm and arm
c. Provided this stimuli starting with right and left upper extremitiesalternativelyin each arm.This is to be provided 3 times with a break of 2 secondswas given to assess the response to the stimuli provided.

STEP 9

(iii) Warm and cold wash clothes:

a. Select the clients non injured part
b. Place the mackintosh under the patient
c. Wet the disposable wash clothes in warm water with the temperature of 101-115 degree F, and squeeze well
d. Apply the warm cloth begin at the hand and ascending up the forearm and arm.
e. Wet the disposable wash clothes in cold water and squeeze well, apply the wash clothes begin at the hand and ascending up the forearm and arm.
f. Provide this stimuli starting with right and left upper extremities alternative for 5 seconds in each arm.This is to be repeated 3 times with a break of 2 seconds was given to assess the response to the stimuli provided.
g. Dispose the warm and wet clothes in kidney tray

POST PROCEDURE CARE:

a. Keep the patient in supine position
b. Check the vital signs and monitor Intra Cranial Pressure (ICP)
c. Replace equipment
d. Observe the client for any discomfort
e. Document the procedure and reaction of client during and after the procedure.

APPENDIX – H

BLUE PRINT OF THE RATING SCALE

SL.NO.	ASPECTS	NO OF QUESTIONS	UESTIONS NUMBER	WEIGHTAGE (%)
1	Eye opening response	4	1-4	26
2	Verbal response	5	1-5	34
3	Motor response	6	1-6	40

Total Questions : 15

Total Scores : 100

Scoring System

0 – 6 = Poor Recovery

7 - 12 = Average Recovery

13 - 15 = Good Recovery

APPENDIX – I

INTERVIEW SCHEDULE ON STANDARDIZED GLASGOW COMA SCALE (GCS)

Instruction:

The investigator read the questions one by one and provided the tick mark ( ) against the response as relevant to the individual.

Eye Opening Response	Spontaneous –open with blinking at baseline	4 Points	
	Opens to verbal command, speech, or shout	3 Points	
	Opens to pain, not applied to face	2 Points	
	None	1 Points	
Verbal Response	Oriented	5 Points	
	Confused conversation but able to answer questions	4 Points	
	Inappropriate responses, words discernible	3 Points	
	Incomprehensible speech	2 Points	
	None	1 Points	
Motor Response	Obeys commands for movement	6 Points	
	Purposeful movement to painful stimuli	5 Points	
	Withdraws from pain	4 Points	
	Abnormal (spastic) flextion, decorticate posture	3 Points	
	Extensor (rigid) response, decerebrate posture	2 Points	
	None	1 Points	

APPENDIX – J

EVALUATION CRITERIA FOR VALIDATING THE TOOL

Respected Madam/Sir

Kindly review the item tool and if you agree with the criteria please put a tick ( ) mark in "Relevant" column, otherwise place a tick mark ( ) in "Need Modification" column or "Not Relevant" and give your comments in the remark column.

SECTION A: DEMOGRAPHIC DATA

SL.NO	ITEM	RELEVANT	NEED MODIFICATION	NOT RELEVANT	REMARKS

SECTION – B

STANDARDIZED GLAS GOW COMA SCALE (GCS) FOR TOTAL BRAIN INJURY (TBI) PATIENTS

SL.NO.	ITEM	RELEVANT	NEED MODIFICATION	NOT RELEVANT	REMARKS

ANNEXURE – L

EVALUATION CRITERIA CHECKLIST FOR VALIDATION OF INTERVENTION ON SENSORY STIMULATION ASSESSMENT MEASURE (SSAM)

The expert is requested to go through following evaluation criteria check list prepared for validating the intervention on Sensory Stimulation Assessment Measure (SSAM) on the level of consciousness among Total Brain Injury(TBI) patients. There are three columns given for responses and a column and facilitated your remarks in remark column given.

INTERPRETATION OF COLUMNS

Meets the criteria – Column: I

Partially meets the criteria – Column: II

Does not meets the criteria – Column: III

S.NO	CRITERIA	I	II	III	REMARKS
I	CONTENT				
1	SELECTION OF CONTENT				
1.1	Contents meet the objectives				
1.2	Content has up to date knowledge				
1.3	Content provide correct and accurate information				
1.4	Content coverage				
II	ORGANIZATION OF CONTENT				
2.1	Logical Sequences				
2.2	Continuity				
2.3	Integration				
II	FEASIBILITY/ PRACTICABILITY				
1	Suitable to the clients				
2	Acceptable to clients				
3	Interesting and useful to client				
IV	ANY OTHER SUGGESTION				

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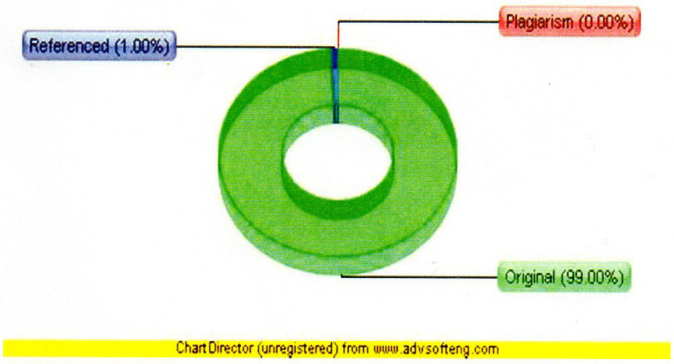

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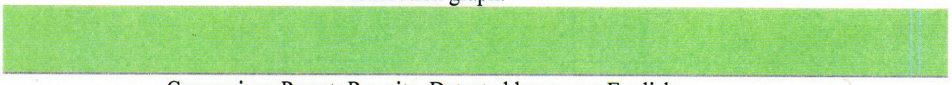

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